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ABSTRACT

These 43 papers focus on changes in vocational assessment and evaluation. Selected titles include "Review of the Needs of Physically Handicapped Persons in the Vocational Counseling Process and a Possible Solution" (Ranson); "Vocational Assessment in the Management of the Chronic Pain Patient" (Dutton); "Vocational Evaluation of the Individual with Epilepsy" (Nolte); "Back to Work: A Vocational Plan for Chronic Pain" (Curtis, Cook); "Short-term Out-patient Vocational Evaluation for the Rural Population" (Harder); "Modifications of a Career Information Delivery System for Use with Hearing-impaired Persons" (Marut); "Delivery of Vocational Evaluation services to Deaf Persons" (Marut); "Training Opportunity Profile for Visually Impaired Persons (TOP-VIP)" (Peterson); "Vocational Assessment of People with Severe Physical Disability" (Frank); "Vocational Assessment: A Tool Texas Is Putting to Use in Offender (Re)habilitation" (Spitznagel, Dews); "Late Effects of Poliomyelitis" (Fairhurst, Halstead); "Implications of Cognitive-behaviorism for Vocational Evaluation" (Bodenhamer, et al.); "Research Update: A Vocational Evaluation Program for Quadriplegics" (Alfred); "Transitioning Special Education Students from School to Work" (Ashley, et al.); "Personnel Development of School-based Vocational Assessment Personnel" (Peterson); "Assessing the Vocational Adaptivity of High School Students with Mild Cognitive and Intellectual Deficits" (Thomas); "A Vocational Screening Process for Transitional Planning at the 9th Grade Level" (Downs, Conlon); "Vocational Evaluation in the Public Schools--the Virginia Model" (Scott, Prezioso); "The Impact of the Carl D. Perkins Act on Vocational Assessment" (LeConte); "Vocational Assessment as an Aid in the Transitioning Process" (Davis, Foster); "Applications of the Vocational Decision-Making Interview (DMI) to Vocational Rehabilitation and Special Education" (Czerlinsky); "Why Direct Vocational Training Works" (Goodfriend); "A Study Regarding Placement and Performance of Students Receiving Vocational Evaluations"

(Evans); "Vocational Assessment in the Public Schools" (Brolin); "Comparison of Vocational Evaluator Positions in Traditional Vocational Rehabilitation, School, and Private-for-profit Settings" (Thomas); "Work Hardening" (Taylor, Blaine); "Ecological Determinants of Vocational Evaluation" (Murphy, Hagner); "Computer Assisted Report Processing in Vocational Evaluation" (Smith, Rothacker); "A Critique of the Research Data Base Relative to Work Adjustment" (Akridge); "Work/Abilities: An Integrative Approach to Vocational Evaluation" (Awtrey, et al.); "Critical Attributes of Vocational Rehabilitation Facilities" (Czerlinsky, Smith); "Vocational Evaluation" (Edgcomb); "A Market Orientation to Vocational Evaluation" (Comegys, Smith); "Data Bases and Vocational Decision Making" (Botterbusch); "Development of a Self-Administered Computerized Vocational Assessment System" (Krass, Conlon); and "Vocational Evaluation: What Direction" (McDaniel). (YLB)

THE ISSUES PAPERS

Second National Forum On Issues In Vocational Assessment

March 13-15, 1986
Dallas, Texas

Stout Vocational Rehabilitation Institute
School of Education and Human Services
University of Wisconsin-Stout
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SECOND NATIONAL FORUM ON ISSUES IN VOCATIONAL ASSESSMENT

THE ISSUES PAPERS

Edited by

Ronald Fry

Papers presented at the Second National Forum on Issues in Vocational Assessment, March 12-15, 1986, at the Ramada Hotel/Market Center, Dallas, Texas.

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EDITOR'S NOTES

Probably the first thing you will notice about this book is that each paper has a different type style. Instead of taking the time to retype all the papers, we asked the presenters to type their own so that we could print directly from those papers. In that way, we could really speed the process of getting the information from the conference to the reader in the shortest period of time.

I want to thank all the presenters for taking extra effort to get their papers to me in finished form. It's characteristic of their professionalism and desire to teach and share information.

Ronald Fry
Publication Editor
Materials Development Center
University of Wisconsin-Stout
Menomonie, Wisconsin

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ASSESSMENT IN EDUCATIONAL SETTINGS

ASSESSMENT - A COLLECTION OF DIFFERENT TOPICS

INTRODUCTION

Whatever the terms you use (vocational assessment, vocational evaluation, work evaluation, etc.), these are processes which are undergoing great change. Computers, reduction in financial resources, new populations being served - all of these are factors which have contributed to significant change and growth in vocational assessment. It's hard to keep up with it all! That's why we had the First National Forum on Issues in Vocational Assessment in Atlanta in late 1984. The field was changing so rapidly, and there was so much new information we had to get together and take a look at where we were at. We learned a lot and we shared a lot at that conference. But because our methods and techniques were evolving so rapidly, it was obvious that a second conference would serve again to help us to get up-to-date. Thus, the Second National Conference on Issues in Vocational Assessment was held in Dallas in March, 1986.

Like the first conference, the second conference was not a rehabilitation personnel only conference. Professionals from special education, guidance and counseling, vocational education, and psychology were present as participants and presenters. We learned a lot from one another and we thank everyone for their contributions to vocational assessment.

Gary Sigmon
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REVIEW OF THE NEEDS OF PHYSICALLY HANDICAPPED PERSONS IN THE VOCATIONAL COUNSELING PROCESS AND A POSSIBLE SOLUTION

SHERYL RANSON, PH.D.

Abstract

A review of the literature concerning the vocational assessment and career planning needs of physically handicapped individuals resulted in the conclusion that this population needs detailed physical demands information and a systematic way to search for assistive devices for problem physical demands. Isabel, a software program, is a useful tool in meeting these needs. Isabel compared the physical capacities of the individual to the physical demands of a wide range of occupations, using 95 physical and environmental factors. The system also allows the user to search for assistive devices for problem physical demands.

Introduction

This paper will describe the results of a study and literature review concerning the specialized needs of physically handicapped persons in the vocational counseling process; a concept that was developed to address these needs; and a computer software program based on that concept that is now available to help address these needs.

Background/Literature Review

In 1979, the National Occupational Information Coordinating Committee (NOICC) funded a study through the Florida Occupational Information Coordinating Committee and the Florida Association of Rehabilitation Facilities to examine the special needs of physically handicapped individuals in the vocational counseling process. NOICC has been responsible for assisting states to develop and make available a broad range of career information. Private companies are also offering computerized and hard copy systems that allow an individual to select careers based on their interests, educational level, desired income, etc. NOICC's interest, however, in 1979, was to examine the special vocational needs of persons with physical disabilities.

This one year study and literature review resulted in the following conclusions: persons with physical disabilities have a need for 1.) occupational information which includes detailed and accurate data on the physical requirements of jobs; 2.) a method to obtain detailed information about the physical capacities of the individual; 3.) a systematic and comprehensive way to compare the physical capacities of the individual with the physical requirements of occupations of interest; 4.) and lastly, a method to consider assistive devices information if there is a discrepancy between what the individual can do and what the occupation requires (Seigel et al., 1980).

This study found that these needs are not met in existing vocational information resources because they use either the disability method or the rating method to compare an individual's physical capacities to the physical requirements of occupations (Seigel et al., 1980).

In the disability method, disabled people are classified into various disability groups such as the spinal-cord injured, the visually impaired, and so on (Hanman, 1958). An individual with a particular disability reviews only those occupations feasible for persons with that disability. Using this method can overly restrict and stereotype persons with physical disabilities. This approach also fails to take into account the differences between people. Persons with the same physical disability can differ widely in their capacity to perform the physical demands of occupations.

In the rating method, an individual's physical capacities are compared to the physical demands of jobs using general or aggregate terms like "light" lifting (Hanman, 1958). Many existing systems use this approach. The use of these general or aggregate terms makes it difficult to determine the feasibility of

occupations of interest. Using the computer further exacerbates this problem in that entering data like "light" lifting can automatically eliminate a large number of occupations, many of which the individual could potentially do. The computer can very rapidly reduce an individual's choices using this aggregate approach.

Development of Isabel

Isabel (as in is-able) is a software package that attempts to address the needs identified in the NOICC study. It is a revised and updated version of the Job Related Physical Capacities system originally made available by the Florida Association of Rehabilitation Facilities (F.A.R.F.) (Morgenthau, Ranson, Stevens & deMarsh-Mathues, 1984).

The system is based on the concept that physically disabled individuals should select occupations in the same manner as able bodied individuals; that is, based on their interests, educational level, desired income, etc.; on what they can do, not on what they cannot do. Further, that if physically disabled individuals select occupations in this manner and have access to: 1.) detailed physical demands information on occupations of interest; 2.) a way to compare their physical capacities to the physical demands of these occupations; and 3.) a logical way to search for assistive devices to eliminate problem physical demands, it should increase their occupational choices. (Morgenthau, Ranson, Stevens & deMarsh-Mathues, 1984).

The Isabel Approach

The Isabel system uses a step-by-step approach to assist the individual with a physical disability to determine the feasibility of occupations of interest. The system uses ninety-five (95)+ physical and environmental factors to describe both the occupation and the career seeker. These factors represent a detailed extension of the physical and environmental factors used in the Dictionary of Occupational Titles (Peterson & Buchanan, 1985). The system compares the individual's profile to occupations of interest and reports possible discrepancies between the job requirements and the individual's physical capacities.

The step-by-step process includes:

A. Register the client
B. Collect biographical information
C. Describe client's physical condition (capacities)
D. Designate occupation of interest to be analyzed
E. Compare client's physical capacities to occupation's requirements
F. Define keywords to search for aids pertinent to a requirement
G. Review available aids which match keywords
H. Select possible aids for requirement being analyzed
I. Print occupational interview results for client.

A short description of what each step entails is included next.

Step A and B. Register the client and collect biographical information. Steps A and B enable the user to register and collect biographical information on the counselee. This information is stored for future retrieval and/or to print the summary report listed as the last step.

Step C. Describe client's physical condition. Step C involves filling out the 95+ physical and environmental factors as they relate to the counselee. This information may be collected by the counselor and client, by the vocational evaluator, physical or occupational therapist, or another qualified professional. Such instruments as the Functional Capacities Assessment instrument developed by Polinsky Memorial Rehabilitation Center staff of Duluth, Minnesota, are particularly helpful in filling in these data.

Step D. Designate occupation of interest to be analyzed. This step requires the user to fill in a DOT occupation that meets his interest, educational level, desired income, etc. from the list of occupations in Isabel. It is assumed that vocational counseling has occured prior to this step which enabled the individual to select an occupation, disregarding physical demand factors.

Step E. Compare client's physical capacities to occupation's requirements. In this step the ninety-five (95) physical and environmental requirements of the occupation of interest are compared to the physical capacities of the counselee. If there are discrepancies between what the individual can do and what the occupation of interest requires, these appear on the screen as "possible discrepancies." The counselor and counselee review these possible discrepancies and determine if an assistive device review is required or if the occupation seems feasible as is.

Step F. Define keywords to search for aids pertinent to a requirement. If a determination is made that an assistive devices search is needed, this step begins the process of locating an appropriate aid. Each assistive device in the Isabel system is paired to a physical and/or environmental factor(s) and a limited number of keywords. This step enables the user to search for assistive devices by physical/environmental factor and key words.

Step G. Review available aids which match keywords. Once a physical or environmental factor and a keyword(s) have been selected, step G provides a listing of aid names which match the selected factor and keyword(s). The task at this step is to review the names of the assistive devices to determine the counselee's interest in the assistive devices listed. If an assistive device is of interest, the user moves to the next step to review the description of the device.

Step H. Select possible aids for requirement being analyzed. Assistive devices of interest to the user are described at this step. A brief description of the product, distributor(s) information, a cost range, and when the information was last updated is included. The user reviews the description and selects the assistive device if he would like to see it printed on the summary report provided at the end of the session.

Step I. Print occupational interview results for client. At the end of the session, Isabel prints a summary report that includes what occupations were reviewed, possible discrepancies between what the counselee can do and what the occupation requires, and any assistive devices that were selected for further review.

Uses of Isabel

The original purpose of the Isabel system was to provide needed information to career seekers who have a physical disability. However, Isabel is also useful in the vocational evaluation, vocational training, job placement,

and expert testimony aspects of the rehabilitation process (Peterson & Buchanan, 1985).

In the vocational evaluation process Isabel provides needed physical demands and assistive devices information. It allows the evaluator to consider the feasiblity of occupations of interest and take into account the usefulness of a wide range of assistive devices. Using Isabel in the vocational evaluation process should enable the evaluator to make more specific recommendations regarding occupations of interest to the counselee (Peterson & Buchanan, 1985).

Similarly the information contained in Isabel can be useful in vocational training and job placement. In both instances, consideration of physical demands and assistive devices information is essential (Peterson & Buchanan, 1985).

Providing expert testimony requires a detailed assessment of an individual's capacities versus the requirements of occupations. The detailed nature of the physical demands data in Isabel and the linkage it makes between physical factors and assistive devices, enables the vocational expert to provide specific and targeted recommendations regarding vocational options for the individual in question.

Lastly, the process used in Isabel can be applied in all these aspects of the rehabilitation process, for occupations not currently contained in the system. The Rehabilitation Professional can utilize the job analysis approach used in Isabel to analyze an occupation of interest. He can manually compare the results of the job analysis and the counselee's profile. It is then possible to search for assistive devices using Isabel by entering information on physical demands that the counselee may have difficulty performing.

Conclusion

Isabel is a software package that was developed to resolve some of the needs physically handicapped individuals have in the career exploration process. The system includes detailed physical demands data, a method to compare a counselee to the physical demands of an occupation, and a systematic approach to searching for assistive devices. The system is potentially useful in the career exploration, vocational evaluation, and job placement processes and in the provision of vocational training and expert testimony.

For further information on Isabel contact the Magellan Corporation, P.O. Box 10405, Tallahassee, Florida, 32302 or call 904/681-6520.

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VOCATIONAL ASSESSMENT IN THE MANAGEMENT OF THE CHRONIC PAIN PATIENT

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Abstract

Pain treatment has evolved into a highly complex and encompassing speciality. While it is clear that pain is more than the body's response to physical trauma, it is equally clear that the chronic pain patient presents more than just an individual with pain attributed to a physical condition. Yet, a chronic pain patient population presents some interesting and potentially encouraging employability characteristics. Even with the presence of chronic pain, a vocational evaluation can be initiated rather quickly without fear of being ill-timed or premature. This population has definite positive vocational strengths upon which to establish a successful vocational service delivery program which will focus on assessment and plan formulation. First, vocational assessment is a systematized experience involving vocational interviews and appropriate vocational evaluation to obtain a solid cross-reference of the patient's foundation of skills, aptitudes and abilities. Information is then fed back to the patient and, in conjunction with traditional therapies, a treatment plan and placement plan is devised. This workshop session will present the vocational evaluation component of this program and why it should be the focal point of insurance rehabilitation.

The program at North Fulton Medical Center has at its foundation a team concept of specialists whose function is to bring to the patient state-of-the-art input to individualized problems. At North Fulton, the therapies are designed to provide maximum exposure to the various disciplines charged with changing the response to pain - each with definite responsibilities in the total program yet much more than a gathering of diverse professionals. While it is clear that pain is more than the body's response to physical body damage, it is equally clear that the chronic pain patient presents more than just an individual pain attributed to a physical condition.

Pain represents an extremely debilitating residual of physical trauma and injury. It costs health care services and private individuals over 50 billion dollars a year in direct costs alone. To calculate the hidden but certainly substantial cost in job loss, salary loss, family disruption, alcohol and drug abuse associated with the disability of some estimated 40 million individuals is almost impossible. North Fulton Medical Center/AMI recognized that the only effective method of treatment to address the totality of the disablement is in the bringing together of a team of specialists (medical, psychological, vocational and family) to deal with the problem in a unified and goal directed manner.

Upon admission, the program focus is primarily medical for obvious reasons. A major factor underlying treatment is to encourage increased activity levels in all major appropriate areas. Specific exercises and activities - both self help and functional are initiated to reduce impairment. Briefly, this is accomplished by physical therapy to regain maximum medical improvement and by occupational therapy to initiate alternative methods of functioning and of seeking vocationally relevant goals. Equally critical is initiating treatment to reduce patient medications, review medication use and dosage and break drug dependencies. Team members seek to reduce pain behavior and to encourage behavior more in keeping with health and recovery. These approaches at North Fulton/AMI are heavily grounded on specific psychological modalities. Psychotherapy is provided regarding adjustment to loss and disability, patient self-management strategies are explored and coping strategies are recommended and provided. Patient recovery potential is dependent upon restoring, or beginning, social and interpersonal skills.

At the foundation of this ambitious, yet disarmingly simple medical treatment strategy, is the vocational services package. It is not out of line to draw attention to the increasingly loud cries from established medical clinics whose excellent treatment programs breakdown shortly after patient discharge. What is now accepted is the discovery that medical services can be affective in reducing pain and increasing physical tolerance. These programs usually do not have a vocational services component for patient planning, analysis, or return to work assistance. It is any wonder that when the patient is faced with the overwhelming circumstances of return to work activity that debilitating pain symptoms quickly, inevitably return. Without appropriate occupational intervention and vocational rehabilitation services, return to work efforts on the part of the patient can be side-tracked very quickly. Therefore, the major goal of vocational services is to evaluate potential, educate and provide answers to pain patients about job selection and career development. Vocational choice issues for this population has been heretofore excluded from expressions of vocational planning and exploration.

A chronic pain patient population presents some interesting and potentially encouraging employment characteristics. As to their educational needs, these patients have been out of work in more cases for several years. They tend to underestimate their abilities and the vocational assessments provided may be their first experience ever in learning about their work talents, skills and strengths. Even with the presence of chronic pain, we have found that vocational evaluations can be initiated rather quickly without being premature or ill-timed. While physical stamina and tolerance must be considered in scheduling, the function of aptitudes are generally unimpaired. And, also, don't forget that resuming normal lives means focusing the patient's attention on beyond pain endeavors and issues.

What must be accepted by evaluators, administrators and referral sources, however, is the high risk category of these patients if the only valuation of the program is based upon return to work percentages. In the North Fulton program, the end product of the vocational evaluation and services program is not a return to work. What is an end product is the reestablishment of vocational momentum which impacts dramatically upon making gains in medical rehabilitation services and directs future energies toward placement goals. Logically and factually, with these very difficult cases, four weeks of inpatient vocational assessment and counseling is not going to wipe out months, even years of pain symptomatology and sometimes marginal vocational adjustment even prior to the trauma.

Now, to the Vocational Assessment Program itself. First, assessment is a system of vocational interviews and formal evaluations to obtain a cross-reference of the patient's foundation of skills, aptitudes and attitudes. Second, this information is returned to the patient and when appropriate to the family, the attending pain center staff, and jointly a placement program of targeted jobs or at least a vocational direction is devised. Third, if approvals are obtained from the insurance carrier or sponsoring source and the logistics of time and proximity of the patient's community allow, an active patient-oriented. individualized return to work program is implemented.

The Assessment Stage. Somewhere with the very first several days of admission, the vocational specialist interviews the patient to begin to develop an appropriate occupational plan. This meeting is not the first. Within the admission application process a meeting occurs with the potential patient to review with them the expectations and goals each has of the other in a vocational sense.

If time permits, at the first meeting during the admission application process, several untimed tests are administered.

1. Wide Range Achievement Test. Reading/ Word Recognition to screen reading and language capability. This deficit, if present, will impact with the total treatment program.
2. Vocational Preference Inventory to establish the vocational parameters of the program and to provide data on identifying a compatible work environment.
3. Eysenck Personality Inventory to assess the patient's anticipated reaction to the social and situational pressures found in the work place and in the treatment program.
4. An estimation of the patient's self-concept.

As an inpatient, the first interview goal is to obtain information on the following patient characteristics:

1. demographic and family background,
2. patient's description of the injury and specifically their understanding of the physical residuals or limitations,
3. work experience and estimated transferable skills,
4. education and training experiences,
5. brief financial needs/expectations from employment/resources available,
6. administer previously outlined tests if not already done.

In addition the vocational evaluator/specialist will describe the vocational program, its objectives and the potential achievements and what the patient can derive from it.

Vocational Evaluation. A battery of vocational tests are administered, scored and interpreted by the specialist to the new group of patients. If necessary, the tests will be done individually. The battery has been selected to provide a foundation of capability assessment which has interpretative strength to a number of feasibility and planning decisions. The battery of tests also provides other staff members in the team with a basic understanding of vocationally relevant strengths and weaknesses which will have implications to the patient's therapies. The test battery

consists of pencil and paper tests which have as the basis for inclusion the factor that every occupation will demand some measure of skill and familiarity with it. Another strength is that the statistical data is profiled using pain program and workers' compensation normative figures for comparison and prediction.

The tests which we have selected and which we believe you should consider in your selection process meet the following criteria:

a. The test is appropriate and realistic to an adult, physically disabled population.
b. The test can be administered and used even if the patient is not at 100% of maximum medical improvement.
c. The test is cost-effective and uses a minimum of staff time in grading or interpretation.
d. The test is readily obtainable and requires little in the way of special, unrealistic space requirements.
e. The test can be administered fairly quickly and does not require over 45 minutes of sitting or concentration.
f. The entire test battery requires on 3 to 4 hours to conduct.

The following tests illustrate these points. They are included here to present the kinds of results and kinds of tests which can be used. While the individual test is a matter of personal and professional choice, we believe the point to be made is the concepts evaluated. These concepts are:

a. a performance based, non-language measure of overall capability - like the Revised Beta II,
b. a measure of communication, business based abilities and functional information processing ability like the General Clerical Test,
c. a measure of visual perception, speed and accuracy like the Minnesota Clerical Test,
d. a measure of the understanding of mechanical concepts and the relationship of physical elements in potential situations like the Bennett Mechanical Comprehension Test,
e. a measure of dexterity and coordination and manipulation of small objects like the Purdue Pegboard and Pennsylvania Bi-Manual Worksample.

To illustrate some of these practical results and to show how the data obtained from the vocational tests can be critical to the overall rehabilitation of chronic pain patient, we will now look at a sample case of results.

Case Study. This study involves a forty-five year old woman who injured her back at work as a textile machine operator. On the day of evaluation, she had been out of work from her injury for 3½ years.

From a medical standpoint, she had undergone a diskectomy one year after her injury. She was overweight, taking pain medication and had a history of multiple hospitalizations due to other unrelated medical problems. Psychologically, she was over-focused on physical concerns and tended to avoid intense emotional issues by focusing on physical problems.

Approximately five months before entering our program, she completed a four week work conditioning program at a rehabilitation center near her home. Upon completion of this program she was released to return to light duty work with a vocational focus on clerical training. She enrolled in a vocational/technical school near her home and completed one quarter of clerical courses. She was unable to attend further studies because of an increase in back pain and inability to sit for long periods of time.

Several months later, because her pain continued to interfere with her functioning, she was referred to our Pain Program for an evaluation.

As part of the evaluation, she was administered the Rehab Planning Index.

Results from the Self Concept Scale indicated that she was undergoing some substantial adjustments to the impairment and would need considerable help and support to assure her follow through with goals and plans. She also had a strong need to over-control situations and was very cautious in new situations. She disliked taking risks and was fearful of reinjury. She was also seen as very confused about her goals, priorities and social compatible environments.

The Eysenck Personality Inventory indicated that she had a tendency to present herself in a more positive, favorable light.

The Vocational Preference Inventory indicated that she had conventional and enterprising interests. Specific job recommendations included: Mail Clerk, Data Processing Worker, Personnel Worker, Credit Manager and Clerk-Stenographer.

She began our 25 day inpatient Pain Program. Her initial vocational goals were to complete the clerical training and work with her Rehabilitation Counselor to find an appropriate job.

She began making progress physically in her strength, endurance, physical capacities and assertiveness training.

When exploring the clerical field with her, she had a difficult time developing goals. She continued to indicate that she wanted to work, but was unclear regarding what area. Her continued hesitancy to follow through with vocational planning leads us to believe that she was not interested in working. When we confronted her with this, she indicated that she did not want to pursue clerical work.

In reviewing the Rehab Planning Index, we knew that she had the tendency to present herself favorably and was very passive. Therefore, when clerical training was recommended previously, she accepted this as her goal because she thought she should, not because she wanted to. She had a real internal conflict about whether or not she wanted to work. We also knew she disliked taking risks and was very uncertain in new situations. Clerical work was an area to which she had never been exposed. She had worked as a machine

operator in a sewing plant and textile mill. The idea of working in a business setting, starting in a new field with a new employer was too overwhelming for her.

From this point, we began working with the previous employer at the textile mill to look for other jobs available. This would place her back in a familiar setting, with people she knew and the work she enjoyed. By the end of the 25 day program, she made significant improvement physically and emotionally. The employer attended the final team meeting. A video tape of the job being offered was reviewed and approved by the team. The patient was familiar with the job and eager to get back to work. To ensure a safe return to work, the Occupational Therapist visited the job site during her first week back to instruct her in proper body mechanics and pacing on the job.

In conclusion, this patient had chosen retraining that was not desirable to her. Her body took over and protected her. Now, with a better choice, she is successfully at work.

The Rehab Planning Index gave us information about her vocational self-concept, and how she handles stress on the job. This supported the change in vocational goals. This change allowed a safe return to work, minimizing stress for her in a familiar environment and functioning within her physical capacities.

Vocational planning is very important for the pain patient. Not only is a thorough vocational evaluation essential but also essential is the need to look at vocational self-concept, likely response to stress on the job and assess compatible work environments
information about a patient is valuable in counseling strategies and predicting return to work capabilities.

SOCIAL SECURITY EVALUATIONS

PAUL S. MEYER

Abstract

Vocational evaluation has a very significant place in the Social Security disability determination system, and while it has been used on a limited basis in the past, there is increasing attention to the advisability of evaluations being included as a more regular part of the process. However, in spite of the efficacy and usefulness of vocational evaluation, it does not appear reasonable that evaluations should be a routine part of every disability application. Examples of instances in which evaluations are most useful and appropriate will be delineated through an explanation of the determination process and an overview of some types of cases.

It is important to note at the outset that vocational evaluations used in the Social Security disability process are not to determine disability, but rather to determine vocational potential within certain functional limits, known as residual functional capacity or "RFC." The general question to be answered by an evaluation is whether the claimant possesses the vocational capacity or resources, within an assigned RFC, to manage sustained competitive employment at the immediate and present time, without any significant vocational preparation, not whether he or she is disabled.

Answering this question may involve assessing the presence of skills, or determining the transferability of skills from previous employment to less physically demanding employment. In some instances, rehabilitation recommendations may be appropriate, if clearly identified as such, but only when there appears to be strong evidence that benefit from rehabilitation services may be reasonably expected to result in return to employment at some point in the future. Again, however, it is the current employability of the applicant that is at issue, not potential to return to employment with rehabilitation services.

There are two Social Security income maintenance programs which involve applications for disability. These are SSI, Supplemental Security Income, and DIB, Disability Insurance Benefits (also known as RSDHI, Retirement, Survivors, Disability and Health Insurance, and in the past as OASDI, Old Age, Survivors and Disability Insurance). Award of benefits from either program depends on two factors:

1. For SSI, minimal income and resources (there is no requirement that the SSI applicant has worked), and for DIB, enough covered work experience, and
2. Impairment severe enough to prevent the individual from engaging in any substantial gainful activity (SGA). The impairment should be expected to last at least twelve months or result in death.

When applying for benefits, the applicant follows a chain of procedure, beginning with the initial claim. If this results in denial, the applicant may file for a reconsideration, then in sequence for a hearing before an administrative law judge, and finally an appeal to the Social Security Appeals Council. The Appeals Council has the discretion to review a case or not, as it sees fit.

This exhausts the administrative remedies a claimant may use, and the claimant must follow this process including appealing to the Appeals Council before filing a complaint in U.S. district court for a reversal of the determination or a remand for more information.

Since the late 1970s, the disability determination process at these various stages has relied on a system of medical-vocational guidelines,

commonly known as the grid. The grid affords a framework for analyzing the claimant's current residual functional capacity, age, education and work experience.

The grid is designed to provide uniform decision-making for the majority of applicants, and most awards or denials can be determined within the provisions of the grid for medical, age, educational, and work history reasons. To be found eligible for benefits, the premise is that the individual is not able to return to his or her former work, and does not have the ability to engage in other work. For example, an applicant who is fifty-five with limited education and an unskilled work history, who is now restricted to sedentary work, is likely to be found disabled. On the other hand, a forty-five year old claimant limited to sedentary work because of injury, who has a high school education and a history of skilled employment, would likely be found not disabled.

However, it may happen that a claimant's case circumstances do not fit clearly within the grid, and thus additional information may be required. This may result in a need for more medical or psychological consultations, or if vocational information is needed, then a vocational evaluation may be scheduled at one of the various application levels described previously for either SSI or DIB applicants. Such scheduling is generally accomplished through the state Bureau of Disability Determination or Disability Determination Service, of the state Rehabilitation Services Commission or department.

Thus, vocational evaluations are scheduled for the exceptions in the decision-making process, rather than the rule. In the more recent past, a case at the level of hearings has been the most frequent place for evaluations to be scheduled (either before the hearing or afterwards), but there is now increasing emphasis on scheduling evaluations early in the application process, at the initial stage, and on a more routine basis.

When a vocational evaluation is scheduled, a current residual functional capacity, RFC, will generally have been established, which implies that the claimant's medical condition is stable. Often cases referred involve residual functional capacity in the sedentary to light categories. If, however, a claimant's main impairment is nonexertional, such as psychological or a skin disorder such as severe dermatitis, the RFC may be medium work, or unlimited. A vocational evaluation always contains work sampling and frequently includes a psychological and a physical capacities assessment, but these two components are optional and are scheduled as needed.

Within the framework of the basic referral question concerning ability to engage in sustained competitive employment at the present time, information is regularly requested on the claimant's ability to understand, remember, and carry out instructions, to work cooperatively with co-workers and supervisors, to manage day to day stress and pressure, and whether the claimant has the ability to manage his or her own funds independently.

Some of the prime resources of the evaluator include knowledge and skills as a work sample administrator, ability to observe, record and interpret behavior, knowledge of world of work demands and conditions, knowledge of the impact of disability, and ability to integrate medical, psychological, and vocational information in the form of an overall report conclusion. Use of work sample norms that reflect competitive employment performance is essential, as is knowledge of the Dictionary of Occupational Titles and regional employment levels.

A relatively uncomplicated vocational evaluation case is one in which the person is an applicant for SSI, is perhaps twenty years of age, who has a special education background and is functioning in the mildly retarded range with an IQ of 65, with no work experience. In addition to considering the factors mentioned above such as ability to understand, remember, and carry out instructions, level of maturity and ability to work with minimal supervision would be important areas of comment.

Another example of a relatively basic case is one in which the impairment is primarily physical, such as the case of a fifty year old worker with a third grade education, who has worked for only one employer for thirty-four years as a laborer in a lumber yard, who is right-handed and who suffered a serious right shoulder injury. If such a case is referred for vocational evaluation, a specific question to be addressed would entail dexterity and hand use, and the claimant's ability to manage bench work in the sedentary or light category.

But, more often, cases are complex and may involve a psychological impairment, or a combination of limitations such as a back injury, depression, and alcoholism, in a person of advanced age (55) with a semi-skilled employment history, with these limiting conditions listed in order of severity.

Such a case may involve notation of functional overlay, that is, medical examination has revealed some organic problems, but the limitation demonstrated and complaint of pain seem to exceed the amount of organic damage. The evaluation program will be asked to determine answers to the standard questions about vocational functioning, but also address the issue of functional overlay. In addition to work sampling, psychological and physical capacities assessments would be useful components to include as part of this evaluation program.

The functional overlay can be an impairment of psychological, or of voluntary origin. If the impairment is psychological in nature, that is conversion of psychological factors into somatic symptoms, this would likely be revealed during an MMPI as conversion and hysteria, which the examining psychologist would comment on, and also in consistent limitation during work sampling and physical capacities assessment. Autonomic signs of fatigue or pain, such as paleness or pronounced tremors are important observations which the evaluator should document. With all these factors present, based on overall performance during the evaluation program, the overlay can be said to be psychogenic in nature, perhaps caused by inability to ventilate feeling or the conversion of anxiety into somatic symptoms, and as such is as limiting

as pain that is organically based.

If however, an MMPI shows high clinical scales that the psychologist interprets as indicating exaggeration of physical symptoms (given) the applicant has sufficient comprehension to understand the statements in the measure, regardless of whether presented visually or orally), and there is much complaining out of context to physical exertion on samples, as well as lack of general consistency in functioning (being able to walk several blocks to lunch, but not being able to walk short distances during program activities without a break to rest), then it would appear there are conscious contributions to the claimant's limitations, and the overlay is a voluntary or self-imposed one.

In some cases where the primary impairment is psychological, routine consideration of formal mental status may gain greater significance. The profile of formal mental status involves four major factors, commonly referred to as the big four, (1) restriction of daily activities, (2) restriction of interests or hobbies, (3) appearance and ability to care for personal needs, and (4) ability to relate to other people. Information for developing this profile is obtained through review of consultations, such as psychological testing or psychiatric interview, and through interview with the claimant's family members or neighbors. When this information is inconsistent, then in some cases a vocational evaluation may be ordered to clarify functioning in a vocational setting.

In some instances there may be differing opinions about RFC, since medical examinations are relatively short-term, and one examination may be performed on a day when the claimant is feeling better than is customarily the case, and another when the claimant is as impaired as is usually the case. An evaluation may be scheduled to clarify questions about RFC through sustained performance on work samples, and perhaps through a physical capacities assessment.

When it has been shown that a claimant is unable to return to previous work because of impairment, the burden of proving that the claimant can work in different occupations shifts to the Social Security Administration. This may result in an evaluation being scheduled even when the medical impairment is not sufficient to result in award of benefits under the grid system, but it is clear the claimant cannot return to his or her previous work. It is then that the vocational evaluation and the evaluator's knowledge of occupations and occupational trends in the community is particularly valuable.

There are many persons who contribute to the decision-making process, physicians, psychiatrists, psychologists, claims examiners, medical-vocational consultants, administrative law judges, vocational experts, and vocational evaluators. Those who perform vocational evaluations should be fully qualified, and should be persons who are either Certified Vocational Evaluators CVE (Commission on Certification of Work Adjustment and Vocational Evaluation Specialists, 1982, 1985), or who meet the standards for such certification.

Nadolsky (1984) suggests that use of existing public and private agencies represents the best approach to Social Security evaluations, with purchase of evaluations similar to purchase of medical examinations from physicians or hospitals, citing freedom from conflict of interest that might otherwise occur if separate evaluation programs were established as a component of the government's disability determination structure.

In Ohio, vocational evaluations have essentially been purchased in this way since 1967. Noble Allen, Medical Coordinator for the Ohio Bureau of Disability Determination, reports that an informal survey four years ago indicated that approximately .1% of cases in process were scheduled for vocational evaluation throughout the state, or about 100 evaluations at that time (personal communication, March 11, 1986). Currently, the rate is approaching 1% of cases in process. Yet even with this increase in utilization, the overall percentage of cases referred is still low, and it seems clear that vocational evaluations are scheduled to meet the information needs of cases which involve non-standard elements, and evaluations are not otherwise routinely requested.

If ability to engage in substantial gainful activity can be determined through consultations and through administrative methods and use of the medical-vocational grid, it seems wasteful to resort to routine vocational evaluations, which lengthen the decision-making process and may cause undue hardship on some applicants. It seems analogous to ordering a CT scan for a broken arm, when an X-ray would be just as useful. For evaluation to function effectively within the system, the claimant's case circumstances should not fall within provisions of the grid, and the reason for referral should be clear.

Nadolsky (1984) suggests that evaluations should be scheduled to clarify the vocational potential of all claimants whose case circumstances do not meet medical listings. Murov (1986) recommends that vocational evaluations be provided for claimants found disabled, but for whom there is expectation of some recovery. It is likely that there are many cases where a claimant's present condition prevents employment now, but considering the claimant's resources, this person might be a good candidate for rehabilitation services for future employment. From the vocational perspective, however, such evaluations would seem best performed following documented medical improvement, since at minimum an applicant's impairing condition is expected to last at least one year, and projections of vocational rehabilitation needs or employability that far in advance would likely be less accurate than would be so following medical progress.

Pell (1985) notes there appears to be considerable geographic variance as to when and how evaluations will be used, and that this is currently decided regionally or locally. What is needed is a uniform, national policy on the use and scheduling of vocational evaluations, recognizing those instances when it is most effective and useful, just as the medical-vocational grid represents a national policy and is utilized nationally.

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VOCATIONAL EVALUATION OF THE INDIVIDUAL WITH EPILEPSY

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Abstract

Although many individuals with epilepsy do qualify for vocational rehabilitation services, it appears that the outcome of the rehabilitation process often does not culminate in competitive employment. A possible reason for this is that the vocational evaluation did not sufficiently address all aspects which effect the employability of the individual with epilepsy. Lack of vocational experience, vocational skills deficits and psychosocial difficulties will be reviewed as to their role in the etiology of the unemployment. The manner in which these are addressed during vocational evaluation is provided.

An examination of the past statistical studies compiled by the Epilepsy Foundation of America (1975) reveals an unemployment rate of 20-25 percent for the people with epilepsy in the labor market. Fraser (1980) notes that a study in Oregon found that for individuals actively seeking employment for at least one month, an unemployment rate of 19.5 percent was obtained. When the definition is expanded to include those who have lost interest and became discouraged and subsequently stopped seeking employment, the unemployment statistic climbed to approximately 34 percent. As Fraser notes, this latter figure appears to be more representative of the magnitude of the employment problem.

There is little doubt that individuals with epilepsy constitute a rehabilitation population that has been traditionally underserved by the existing vocational and rehabilitation system. Wright (1975) has noted that state and federal programs rehabilitated a smaller percentage of clients with epilepsy in 1973 than in 1962. Further, Schwartz et al. (1968) states that epilepsy is generally acknowledged by vocational rehabilitation, training and placement agencies to be one of the most difficult and least successful disability categories.

In response to these unemployment statistics and professional attitudes the Rehabilitation Services Administration (RSA) Act of 1973 designated epilepsy as a severe disability within the mandate of the Vocational Rehabilitation Service. Further, the RSA Act of 1974 established epilepsy as a priority disability.

It has been over 10 years since epilepsy was designated as a severe disability by the RSA thus qualifying many individuals with epilepsy (primary disability) to receive services through state vocational rehabilitation agencies. Beyond this eligibility determination, little progress has been accomplished. A major problem is that rehabilitation counselors are not comfortable with this population. They do not deal with clients having epilepsy often enough to feel it is necessary to learn more about this disability.

A second major problem is the vocational evaluation of the individual with epilepsy. It is proposed that the following areas must be addressed in the vocational evaluation to discern the etiology of the unemployability:

- lack of vocational experience
- vocational skills deficits
- psychosocial difficulties

Lack of Vocational Experience

Sands (1982) projects that some 80 percent of all individuals with epilepsy are capable of being employed. However, employer attitudes and

misconceptions involving the stigma associated with epilepsy prevent many individuals from accessing the work force (Rickard et al., 1963). The evaluator is faced with an individual who very likely has never had any work experience. The evaluee is vocationally naive and often unrealistic in his/her occupational preferences. When these clients begin to make vocational decisions, they often have little understanding of the skills, experience and education necessary for their projected interest area. Involvement in a work experience program can provide the client with a more realistic context for making vocational decisions. Bell (1968) notes that clients with epilepsy stated preference for the work experience type situation as an aid in their vocational rehabilitation process.

There is a conflict in the literature concerning the importance of seizure type and general seizure control effecting employability. Muthard (1975) states good seizure control contributes greatly to employability, both in terms of the attitude of the employer and the self-image of the individual with epilepsy. In opposition, seizure frequency, age of onset, duration and seizure type were found by Dennerll et al. (1966) to be unrelated to employment. In either case, specific information regarding the epilepsy type, characteristics of the seizures, medical compliance, medication side-effects and the presence of a consistent aura must be discerned. When an aura is consistently present and of adequate duration, the scope of appropriate jobs and the ability to provide independent transportation is increased.

Vocational Skills Deficits

Vocational skills deficits are often present due to the lack of experience in a work setting. Work sample assessments as well as production efficiency ratings in sheltered or competitive situations are appropriate to be completed. Ettinger (1968) notes that assessing the individual with epilepsy in a simulated or real work setting is most useful as it involves a closer approximation of the real job demands.

Rennick (1975) has identified several vocationally significant areas that the evaluator should be cognizant of concerning the interrelationship of epilepsy and anticonvulsant medication. These include memory, attention, perception, language skills, spatial and temporal orientation, autonomic reactions, fine motor coordination, speed, and problem solving skills. Rennick estimates that approximately 50 percent of vocational rehabilitation clients with epilepsy experience some degree of difficulty in these areas. Due to the significance that these deficits could have on the vocational evaluation work sample testing results and acquisition time of any new task, Fraser (1980) suggests one-trial testing situations are not adequate. Two or three practice trials might be necessary. A learning curve should be reviewed to determine if such an approach is, in fact, necessary.

Psychosocial Difficulties

The assessment of the psychosocial deficits is an aspect of vocational evaluation of individuals with epilepsy which is often overlooked in most rehabilitation centers. However, assessment in this area is probably the most important aspect of a successful vocational evaluation. The psychosocial development's impact on the employability of a person with epilepsy is directly associated with the appropriate assimilation of epilepsy into the client's self concept. The impact of the potentially very negative stigma associated with epilepsy on the self concept can result in the development of additional handicapps. Rodin et al. (1977) found that in their study of 369 individuals with epilepsy, 54 percent of their sample had developed associated behavioral problems. Further, the subjects who did not exhibit associated behavioral problems, were well adjusted and the majority were employed. In the Dennerll et al. (1966) study, variables which were found to discriminate employability of individuals with epilepsy included personality and social characteristics. In another study (Freeman & Gayle, 1978) of the random sample of 183 clients with epilepsy receiving services in the state of Maryland's vocational rehabilitation program, most were identified as exhibiting psychosocial problems.

An instrument available but not commonly utilized by vocational evaluators to assess the impact of seizures on various aspects of adjustment is the Washington Psycho-Social Seizure Inventory (WPSI). Developed by Dodrill et al. (1980), this is a 132 item, forced choice inventory which covers eight adjustment areas. These include:

- Family Background
- Emotional Adjustment
- Interpersonal Adjustment
- Vocational Adjustment
- Financial Status
- Adjustment to Seizures
- Medicine and Medical Management
- Overall Psychosocial Functioning

The WPSI was developed in a manner similar to the MMPI (Fraser, 1980). This instrument was developed on a populace with seizures and specifically examines the impact that epilepsy has had on various life adjustment areas. Batzell et al. (1980) found that the vocational adjustment scale clearly differentiates between employed, partially employed and unemployed individuals with epilepsy. Further, Batzell et al. states that from his investigation, utilizing 58 individuals with epilepsy, that the use of the WPSI in the evaluation of employability may be more effective than using only those variables which traditionally have been applied.

Once specific psychosocial problem areas are identified, remediation can be initiated via counseling or peer support group therapy. It is of significant importance that any underlying

psychosocial deficit adjustment area be addressed prior to placement. If not, these deficit areas will continue to resurface in the areas of employment interviewing, on-the-job coping, co-worker relationships, and production efficiency rates.

Conclusion

Vocational evaluation can provide the scope of assessment needed to identify all vocational characteristics of individuals with epilepsy if psychosocial development is also included. Work experience situations afford this referral group with specific job-related information they may lack due to limited job experience. Work sample testing and new task acquisition time should be modified to allow the individual with epilepsy sufficient time to fully understand the task before specific skill assessments are made. Complete knowledge of the medical information regarding the epilepsy and the anticonvulsant medication is needed in order to focus on jobs which are appropriate for the severity of the handicap. Specific counseling may be required to address any underlying psychosocial difficulties which could sabotage job seeking and job maintenance efforts.

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BACK TO WORK: A VOCATIONAL PLAN FOR CHRONIC PAIN

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Abstract

In the past two and one half years, there has been impetus to develop a vocational program to supplement chronic pain services. Through involvement with the pain management program, it was found the team had designed a plan which addressed medical issues. Little to no discussion of vocational outlets and opportunities were provided to clients. Referrals for vocational evaluation identified significant needs and insight had been gained into specific vocational issues of individuals with chronic pain. Vocational evaluation referrals appeared to be premature. Clients demonstrated needs to comprehend roles of rehabilitation professionals, to clarify vocational goals, explore work opportunities, and to understand Worker's Compensation issues. A vocational component was created to address deficit areas and to provide a more holistic approach to chronic pain management. The purpose of this paper is to elaborate on the implications of developing and implementing vocational services to this specific population. The paper will present history and development of program, eligibility criteria, program content, benefits and limitations of program, and issues to consider in development and administration of program. The program is designed to educate the individual of rights and benefits, community resources, and roles of individuals involved in the rehabilitation process. The structure of the learning process is client oriented. Promoting the vocational component was difficult as it was not necessarily a priority issue while clients were in the rehabilitation facility. Obtaining sufficient blocks of time to administer interest inventories, work hardening programs, and career exploration activities was a major barrier to program development. The structure was very haphazard and sporatic. Often, interaction with clients occurred during dinner hour or free time which decreased motivation to participate in the vocational component. The program has progressed to a four week in-house plan with a six week outpatient follow up. The vocational component has become recognized as a valuable entity, particularly as rehabilitation professionals and insurance carriers express primary needs of returning their clients to work. The vocational structure now offers both individual and group didactic sessions. Work hardening activities have been incorporated into the fourth and final week of their stay at the hospital. There is a constant review of the program components and structural changes are made on a continual basis. The team is continually attempting to design a program that best meets the needs of the individual clients.

History

Rural communities traditionally have had special problems in meeting medical and rehabilitation needs of individuals in their communities. Often these needs are met through referrals to facilities in larger metropolitan areas. Hilltop Rehabilitation Hospital of Western Colorado has recognized the need to provide rehabilitation services which meet the ever changing rehabilitation needs of individuals in this region. Increases in industrial injuries have led to the development of rehabilitation services for individuals suffering from chronic pain. One of the newer programs initiated by Hilltop Rehabilitation Hospital is a Chronic Pain Management Program (CPMP) designed to meet the needs of individuals in rural communities of Western Colorado and Eastern Utah.

The staff designing this program utilized a multidisciplinary medical model approach. Members of the Chronic Pain Team consisted of an occupational therapist, physical therapist, neuropsychologist, physiatrist, family service representative, nurse, recreational therapist, and music therapist.

The program was initially designed to change the way an individual responds to pain. Programmatic goals included, but were not limited to, increasing functional ability and decreasing or eliminating pain medication.

As the program took form, referral sources including insurance carriers saw the benefits of expediting the client's return to work. It became evident that vocational and avocational activities were needed to further enhance the effectiveness of the program. To address this need, the Pain Team began a referral process to Hilltop Independent Living Center Vocational Evaluation Program. The vocational evaluator became a member of the Pain Team. Through this individual, a vocational component was established to assess vocational strengths and limitations of each client.

Upon initial contact with clients, it became apparent that a vocational evaluation was premature. Clients showed a lack of understanding concerning the roles of rehabilitation professionals, Worker's Compensation issues and demonstrated the need to clarify their vocational goals. In order to provide a more holistic approach to chronic pain management, the Independent Living Center, in cooperation with the Chronic Pain Management Team, designed a vocational component to address these deficit areas.

Eligibility Criteria

Individuals have been referred to the Chronic Pain Management Program by rehabilitation counselors, physicians, and through self referral.

Prior to acceptance into the program, a thorough screening process has occurred.

Physical and psychological screenings by the hospital's physiatrist and neuropsychologist have been initiated prior to a pain staff meeting. In the first staffing, the team has discussed appropriateness of the client in a group setting and his/her level of adaptability to the program's structure. Prior to admittance to the program, potential clients have been presented with information about their responsibilities and the program's responsibilities and expectations. Individuals then were able to decide if the program met their needs.

The team accepted groups of approximately three to five individuals who were scheduled as inpatients for three weeks, with six weeks of outpatient follow up services.

During the first week of the in-house program, each client was further assessed by modalities provided by the Pain Team. The vocational evaluator assessed the individual's vocational needs utilizing information provided through medical records, client group discussion, and communication with the referral source.

All individuals accepted to the CPMP were found to potentially benefit from information provided through the vocational component. Although not all individuals were found to be motivated or felt the need to return to work, it was the hypothesis of the staff that information regarding Worker's Compensation, work simplification, time management, rights and benefits, and counseling would assist client in developing an alternative lifestyle.

Design of the Vocational Program

The vocational component was designed to meet once a week for one hour discussions in group settings. The group explored their work history, work attitudes, motivation to return to work, financial status, present status in the rehabilitation process, knowledge of job seeking skills, and community resources. Depending upon each person's needs, a structure was designed to meet the individualized goals of each client. (Beck, 1985).

A great deal of discussion centered around issues of adjustment to disability. A filmstrip was presented to stimulate discussion regarding rights and benefits of individuals with disabilities, employment issues facing disabled workers, and ability versus disability.

Handouts were provided to clarify issues discussed within the group setting. Interest inventories were utilized to explore job families and identify transferrable skills for individuals considering job changes.

The vocational program also expanded into avocational areas and home management techniques. For example, homemakers were supplied information regarding adaptive cleaning tools. Those individuals opting to take an early retirement were able to explore adaptive equipment which aided in continued participation in hobbies.

After the first group completed the CPMP, it was discovered that the allotment of time for the vocational component was not sufficient to meet needs of clients. After discussing this problem with the Pain Team, an additional one hour lecture period was acquired.

Through program evaluation, it was found that group dynamics did not promote the most conducive environment for learning. Vocational staff felt individual one on one time would assist in building rapport and better support the client in active problem solving. One hour of four remained allocated for lecture and group discussion. Each client was seen on an individual basis approximately once a week.

Program Expansion

The program has been expanded to four weeks of structured inpatient activity with six weeks of continuing outpatient follow up.

During the first week, the vocational needs are assessed as in the original program. Particular emphasis of the client's overall status in the rehabilitation process is discerned. Basic explanations of rehabilitation professionals and their roles pertaining to the client's service needs are thoroughly explored.

A list of community resources describing service agencies and contact persons is disseminated. The opportunity is provided for clients to actively seek and make contact with community services if they feel it necessary. An interest inventory is presented for the client to complete during free time. At this point in the program, clients are contacted on a one to one basis and have had little to no involvement in a vocational group.

Upon completion of week one, pain patients gather for a one hour discussion of the interest inventory results. Job families, transferrable skills, and appropriate job goals are discussed in the group. (Matkin, 1983).

One to one client contact continues during the second week. Topics covered include advocacy issues, rights and benefits, 504 legislation, unemployment, civil rights issues, and employer attitudes as pertaining to people with disabilities. Client contact with professionals such as rehabilitation counselors and attorneys also takes place during this week.

During the third week, further exploration of job families takes place. A great deal of time is spent discussing adaptive equipment, funding sources, work simplification, and job modification. Concepts of job restructuring are introduced which allow the client to explore work alternatives such as flex time, job sharing, part time, and extended hours for work. Job seeking skills are reviewed with references given for interview skills and development of resumes and cover letters. Concerns and approaches for successful job interviews are presented. (Smith and Crisler, 1985).

The Work Hardening Program is introduced the fourth week to help clients increase physical and/or mental endurance necessary to participate in work activities. Work activities are provided and gradually increase in length of time and difficulty of task as the individual's tolerance increases. Clients are assigned separate job sites and are rotated in order to experience a variety of job demands. (Matheson, L.N., Ogden, L.D., Violette, K. and Schultz, K., 1985).

The follow up program for the vocational component is provided on an as needed basis. Vocational staff network with rehabilitation professionals and provide supportive services if necessary. Clients are encouraged to contact staff regarding additional information and services.

Program Limitations

When reviewing the structure of the vocational component, factors which enhanced or deterred client progress became apparent. With each client came special issues to consider in service delivery. Programmatic changes were made as limiting factors were recognized. Problem areas which were most apparent are discussed here.

Initially, the primary limitation in providing a vocational component revolved around scheduling problems and lack of time to disseminate adequate information. Of particular concern to both clients and vocational staff was the lack of time and available resources which could assist in explaining basic Worker's Compensation information clearly and concisely.

In addition, rehabilitation counselors occasionally expressed concerns that clients did not fully understand the role of the counselor. (Smith and Crisler, 1984). Services which explained roles of various professionals were requested. Conversely, other referral agencies simultaneously expressed concerns regarding duplication of services and reimbursement issues. Some rehabilitation professionals expressed concerns regarding compatability of vocational program plans provided by two separate agencies. Although the vocational component was designed to enhance and expedite meeting basic needs of clients, networking with a variety of referral sources was difficult and required an understanding of the individual philosophies of each agency. (Matkin, 1983).

A second issue in developing a vocational component was that of combining varied philosophies of Pain Team members. Philosophically, Pain Team members possessed two diverse ideas; medical model versus the community based model. The integration of these models became essential in order to build a successful vocational component for the program. (Margolis and Fiorelli, 1984).

Initially, the vocational component was considered an ancillary service for clients. Time sharing, inappropriate time slots, and general lack of time to schedule clients portrayed low priority for the vocational program. This appeared to influence the level of commitment clients expended in completing tasks.

Frequently, vocational information was presented during the client's free time and dinner hour. Sessions were rushed and clients had difficulty staying on task. Educating the Pain Team as to the extent of clients vocational needs became a factor in further expanding and establishing the vocational component as a viable service.

Additional limitations in developing effective programming for industrial injured individuals included lack of vocational opportunities for high salaried, blue collar workers. Often clients had obtained minimal education or possessed knowledge in one specialty area. If avenues for returning to previous occupations were blocked, clients frequently lacked vocational goals, motivation, or community resources to obtain training in an area which could employ them in their community.

To date, some of the earlier difficulties have been resolved. Through the growth of the program, new issues have surfaced. Transportation between residential and work hardening sites and lack of adequate job sites which provide the clients with meaningful work situations are examples of problems in rural and economically depressed areas at this time.

Program Benefits

Although problems were recognized while developing this program, benefits surfaced which staff feel enhance the clients rehabilitation process. Not only do clients demonstrate increased knowledge of the rehabilitation process, they also actively begin to take steps in problem solving, and express basic knowledge of local resources. Clients increase interactions with their rehabilitation counselors and/or attorney. This demonstrates how the client takes more control and responsibility in the rehabilitation process. (Smith and Crisler, 1985; Beck, 1985).

The vocational component emphasizes the need to broaden the CPMP from a strictly medical model to an integrated approach utilizing community and medical resources. This has led to a more cost effective program.

Individuals in the CPMP are no longer housed within the hospital, but reside in an apartment setting. A community setting is also available for work hardening programs which primarily take place in a modified industrial setting. Utilizing community resources, along with medical facilities, demonstrates how medical and community based models might function cooperatively.

Issues To Consider in Development of Vocational Programs

In our discussion of the vocational component thus far, we have considered such issues as team philosophy, concern over duplication of services, and increasing the number of professionals involved in a client's case, to name a few.

With program development and expansion, issues recur which are often difficult to resolve. This influences program effectiveness and demands attention from the Pain Team staff. Some of these issues are viewed as more universal, while others reflect programmatic problems in rural areas.

Programs in rural areas typically deal with additional burdens associated with the lack of an efficient transportation system. Frequently, clients must utilize professional services in larger neighboring towns. Networking with agencies in neighboring towns becomes more difficult in provision of services and follow up. Clients frequently have to rely on others to transport them to larger cities for

the screening process. This often contributes to postponing the client's involvement in an inpatient program. Thus, clients tend to meet less frequently with service providers which often delays progress in the rehabilitation process.

Job availability is frequently an issue in smaller towns having few, if any, nearby industries. This may necessitate clients to consider changing jobs or relocating for employment which again, creates networking, follow up problems, and social implications.

Delays in referring clients to rehabilitation services often create disincentives to work. (Huneke, 1982). Without knowledge of the rehabilitation process, the motivation and desire to return to work is often dampened. This may be compounded by compensation benefits which outweigh what most clients perceive they could make at a modified or unfamiliar job. (Huneke, 1982).

The client's readiness must be carefully considered throughout the program. Individuals who appear least enthusiastic often benefit greatly from information provided. Occasionally, individuals have not considered their vocational status and need encouragement to begin taking more responsibility in their rehabilitation process. Information presented during the first week of the inpatient program may not be significant until the second or third week when awareness increases and clients adjust to the program.

Issues of when to initiate work hardening programs and vocational evaluation need to be considered. Transportation, available staff, and simulated work sites appropriate to the client's situation all affect how these components can provide information and be utilized within the CPMP.

Motivating the client to return for the follow up Work Hardening Program needs to be further addressed by the Pain Team in conjunction with the insurance carrier. This will further enhance the client's progress obtained during the inpatient program. (Huneke, 1982).

Finally, means of evaluating, reviewing, and modifying the program should be considered early in the program development stage. Whether through follow up services, interagency communication, surveys, statistics, team meetings, or other methods, staff, client, and other agency satisfaction needs constant review.

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SHORT-TERM OUT-PATIENT VOCATIONAL EVALUATION FOR THE RURAL POPULATION

Deborah S. Harder, R.N., C.V.E.

Abstract

This paper describes the creation and implementation of an individualized, comprehensive vocational evaluation service located in a rural location. The innovative techniques of a short-term out-patient vocational assessment service for the physically challenged are shared. This project's philosophy was based on the belief that the individual is best served by being given every possible opportunity to establish or re-establish meaningful vocational participation in our society. Presented in this article are the rationale for developing this service; methods of development; techniques administered; and advantages and disadvantages of the service, including problems encountered.

Project Rationale

Addressing the needs of the physically challenged in a rural location requires creativity and ingenuity. In 1982, staff from HOPE Consolidated Services, Inc., a private non-profit human service agency, and staff from the Williamsport Hospital Harry R. Gibson Rehabilitation Center set out to address the vocational issues confronting this population. The result of this effort was the creation of a project known as Vocational Assessment Services (VAS), which addresses the specialized vocational needs of a rural physically disabled population.

The rural community presents unique challenges to the field of vocational evaluation. Most individuals living in a rural environment have lived their entire life in the same county and have vocationally followed the footsteps of their fathers and mothers. Vocational awareness and interests are limited to their familiar contacts. Educational development is usually no greater than the twelfth grade, and there is a strong sense of commitment to remain in the same environment. These attitudes transcend all levels of the rural population, including individuals with physical disabilities. The disabled are also skeptical about even leaving the area temporarily for evaluational services. Their family and friend support system is so integrated within their coping and survival skills that any alteration causes trauma and is avoided. Thus, the vocational resources available to the disabled must be tailored to meet the vocational needs of the specific rural community.

Methods of Development

Vocational Assessment Services was created from an Establishment Grant awarded by The Office of Vocational Rehabilitation, Department of Labor and Industry, Commonwealth of Pennsylvania. VAS was designed with the goal of providing the physically disabled with a short-term out-patient vocational assessment service that would offer information about an individual's vocational abilities, aptitudes, and interests. This information would then be correlated to the local community's educational services and job opportunities. Therefore, VAS's philosophy was to provide these services in a centralized location within the rural community and offer appropriate vocational recommendations, which would assist the disabled in obtaining competitive employment.

A six-county rural area in north central Pennsylvania was targeted as the impact area of the project. Upon receipt of the grant in September of 1983, the first problem to be addressed was the physical location of the project. After an evaluation of available sites, it was decided to locate the project in a separate satellite facility in a professional office

building. It was felt that a rehabilitation center, hospital, or workshop environment would offer a support mechanism, which could hinder the client from recognizing his/her optimal goal of being as vocationally independent as possible. Conversely, it was felt the office environment assisted in providing a psychological boost to the client of being ready to return to employment. The location chosen was an old school building, which was being remodeled into office space. It met the criteria of being accessible, on the bus line, in the service area of the taxi company, and located at the main crossroads of two major highways. A survey of local hotels/motels was completed to determine rates and accessibility of rooms in case they were needed. Also the availability of accessible food service was evaluated and found adequate.

The next issue addressed was the hiring of the project's staff. The grant provided funding for a full-time coordinator, a work evaluator/placement specialist and a data entry/clerical support person. The job description of the project supervisor required extensive knowledge of vocational evaluation; appropriate educational credentials; and, preferably, some background in marketing. The marketing background was considered important in disseminating information about the service to potential referral sources. The work evaluator was also required to have knowledge of the vocational evaluation process and appropriate credentials. The clerical support person was required to have strong basic clerical skills as well as some knowledge of microcomputers. Microcomputers were to be implemented to meet the word processing, data base, and accounting requirements of the project. Also covered by the grant were funds which would provide educational opportunities for the staff to keep abreast of current developments within the field of evaluation.

Project Objectives

Once the staff was hired, the major program objectives were outlined and defined. The first objective was the establishment of an individualized vocational evaluation service to determine a person's assets, limitations, and behaviors in the context of the work environment in which he/she might function. The second objective was to identify potential job opportunities or work sites for physically challenged individuals. The final objective was to provide a general public relations service about the specific needs of the physically challenged and their abilities as workers. Also information and expertise would be made available to the general community to facilitate the identification and development of potential employment opportunities.

The first task facing the project was an analysis of the local job market. Questions asked included: What current jobs are available, and where are they located? What are the future vocational trends--nationally and locally? What are the community's educational resources, and what possible funding sources are available to the clients? Obtaining answers to these questions proved laborious. Only three of the targeted counties had Chambers of Commerce, which provided directories listing area businesses. The reference section of the local library became a valuable tool. Not only did it provide telephone directories of the other counties listing their businesses, but it also had a resource file, which contained pamphlets and the annual reports of many area firms. Starting with the larger firms, the Human Resource or Personnel Departments were contacted via phone. If we were unable to talk with the department head, we were at least able to obtain a name; and we could then forward a contact letter to the individual directly. If possible, an on-site visit was arranged. Information gathered included an overview of the business; job hiring policies; union involvement; and finding out if they currently employed any disabled persons and, if so, their disabilities and the employer's experience including any problems they may have encountered. An effort was made to determine how willing they would be to hire the disabled and possibly provide some modifications if needed. A data base was created to correlate this information for future reference.

The next task was to gain as much information as possible regarding currently available vocational evaluation instruments, procedures, techniques, and programs. Several facilities were visited in the Commonwealth, which offered vocational assessments. The above issues were probed, noting positives and negatives. A review of the current professional literature was performed (Botterbusch, 1983). Staff attended educational seminars regarding assessment techniques, marketing strategies, and program development. If we were unable to attend a conference, then we purchased the monograph or the book containing the papers presented, if available. We wrote to identified companies that market vocational materials (e.g. work samples, literature, vocational testing protocols) and obtained information regarding their products (Field, 1983). The Commission on Accreditation of Rehabilitation Facilities (CARF) requirements on vocational evaluation were reviewed.

All this information was correlated and analyzed. and immediate and long-range priorities for the project were established. The first priority was to select the appropriate work samples and testing protocols based on job opportunities in the community (McCray, 1980; Botterbusch, 1982; Botterbusch, 1983). Currently, VAS has the ability to select an individualized vocational assessment package from approximately 200 different vocational tools. Some of these tools include Valpar Work Samples; Career Evaluation Systems - Series 100, 200, 250, and 300; Valpar MESA; Career Assessment Inventory; Functional Assessment Inventory; Comprehensive Ability Battery (CAB); PSI Basic Skills Tests for Business, Industry and Government; SAGE; Temperament and Values Inventory; etc. Every effort was made to obtain vocational tools that would address the needs of the potential clients who would have a variety of academic abilities (e.g. reading, math skills, etc.), aptitudes, and interests.

The next priority was to develop referral procedures. An admission policy was established. Criteria included that the client must be vocationally limited due to a physical disability, a minimum age of 12, unemployed or underemployed,

and capable of benefiting from the facility's programs. Since the main goal of the project was to be a short-term out-patient vocational assessment package, the project was designed to obtain as much background information about the client as possible prior to the client's actual participation. When a referral is received, the referral source is asked to furnish as much information as possible. The referral source's questions are then discussed and possible testing options evaluated. The work evaluator always has the option of changing the actual testing package that is administered at any time. VAS operates on an hourly fee schedule, and fees are predetermined prior to the client's admission into the program. The average length of time involving direct client participation is 10-12 hours. The client always interacts on a 1:1 basis with the evaluator. It is felt that this allows a better rapport to be establisned and a more thorough evaluational observation. The evaluator is capable of assessing three clients per work week.

Evaluation Procedures

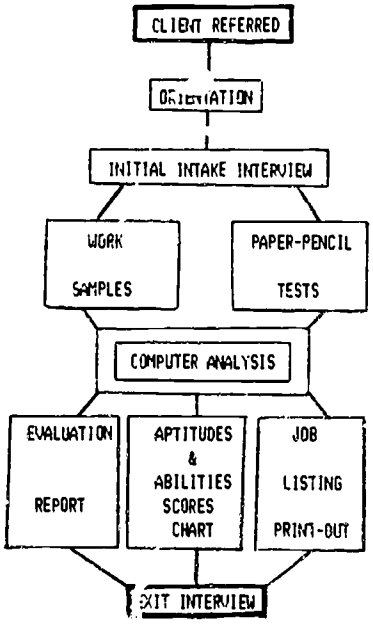
After the referral is received, the client is contacted directly by the evaluator who will be doing the testing. This allows initial rapport to be established and the client's preliminary questions to be answered. If possible, the client is allowed to pick the day he/she will come in for testing. It is felt that this gives him/her the initial feeling that this evaluation will be a cooperative effort. A follow-up letter is sent to the client including a map of the facility, information regarding lunch procedures, reminders to bring eyeglasses, prosthetic devices, etc. The clerical staff and the evaluator now establish a client file, which will carefully document all phone and written contacts regarding the referral, information received, referral questions, evaluation plan, etc. An activity log is used for this purpose, as it provides a quick reference tool to the progress of the file.

On the first day of testing, an intake interview is conducted between the evaluator and the client. This provides an additional opportunity for rapport to be established and for the client to become comfortable in the testing environment. It also furnishes an opportunity for the evaluator to verify the background information that has been received. Areas covered include demographics; social history, including financial obligations and expectations; medical history and current status; educational history; employment history, including military service; and the client's vocational interests and expectations (Power, 1984; Esser, 1980). A simple flow chart diagram is used to explain to the client what the vocational assessment program entails (Figure I).

Once the client has been oriented to the surroundings, including safety regulations, vocational testing is begun. The day is structured to simulate the workday as much as possible. The time schedule incorporates one mid-morning and one mid-afternoon ten-minute break along with a thirty-minute lunch period. The testing day begins at 8:00 a.m. and terminates at 4:00 p.m. The evaluator carefully explains to the client that he/she may find some tests easy and some tests difficult. The client is assured that this is true for all individuals, as we all possess different vocational abilities and aptitudes. The evaluator first administers a work sample that he/she is sure the client will be able to perform relatively easily. This has proven to help the client feel more at ease in the testing situation and build self-confidence. Actual "hands-on" work samples are alternated with paper-and-pencil tests, as this appears to hold the client's interest longer and promote better client participational effort.

For each test administered, a large index card has been completed which contains information listing materials necessary for test administration, instructional directions, and methods of scoring. All directions are copied directly from the test manual using bold print and capitalization. The work evaluator reads the instructions directly from the card to ensure proper test administration so that invalidation of norms does not occur. This has proved helpful in maintaining the standardization of test administration. A client test score form has been developed which allows the evaluator to record all test results on one form. This provides a quick reference sheet of the actual test scores. A copy of this form is provided to the referral source. All forms developed have been placed on the project's microcomputer. This allows for easy modification as new testing options are added. Behavioral observations are also recorded during testing. Areas noted include work tolerance, endurance, coping skills, social interaction, work attitudes, and work manners. Since the client staff ratio is always 1:1, subjective findings can be readily observed.

VAS Flow Chart - Figure I



Report Formats

Each vocational evaluation report is written as if it were a potential court room case. This requires a consistent, comprehensive reporting format (Botterbusch, 1983; Power, 1984; Esser, 1974). To accomplish this, word processing was implemented via an Apple IIe and Apple Writer software. An additional benefit of word processing is that staff report writing time was also greatly reduced. The work evaluator initiates the report by completing a check-off sheet. This form has a variety of optional statements available. If, however, the evaluator wishes to add his/her own, he/she may do so. The check-off sheet is processed by the clerical support person, and the computer automatically correlates the information into the report format. Using word processing assures that no aspect of the vocational evaluation report is overlooked. Graphs are also completed on the computer demonstrating the client's vocational assets and limitations as normed against available statistics. PFS Graph is used for this purpose. Initially, a copy of the final report is mailed to the referral source for its review. An exit interview is then scheduled, at no additional cost, with all interested parties. The graphs are used during the exit interview to provide an excellent pictorial demonstration of the client's strengths and weaknesses. By demonstrating both, the client is provided with a positive but realistic vocational profile. We have found the exit interview very helpful in offering an opportunity for all parties to obtain clarification of the vocational report and in evaluating the vocational recommendations and implementing a vocational plan.

Since inception of the project, all client test scores have been entered on the data base available in AppleWorks software. An analysis of this information will be used to identify common vocational problem areas and to determine vocational assessment needs. Problem areas that have already been identified include lifting capacities, fine finger dexterity, multi-limb coordination, and basic academic skills. Other data tracked concerning the clients includes information regarding referral source, diagnosis, age, sex, marital status, educational background, residence location, and current income sources (Table I). Information gathered will also be used to assess program needs.

Client Data Base - Table I

Referral Sources:	54% private sources (insurance companies and attorneys)
	46% Office of Vocational Rehabilitation
Diagnosis:	30% orthopedic problems
	17% closed head injuries
	16% low back syndrome
	37% other miscellaneous diagnoses
Age:	80% under 40 years of age
	20% over 40 years of age
	58% under 30 years of age
	42% over 30 years of age
Sex:	66% male and 34% female
Marital Status:	40% married
	60% single, divorced, separated, or widowed
Educational:	28% attended high school but did not complete
	57% graduated from high school or obtained GED
	15% some form of education after high school
Residence:	57% live within an hour's drive of facility
Income Source:	33% worker's compensation
	19% sick pay benefits
	16% auto insurance benefits
	16% no reported means of income
	12% unemployment income
	4% currently employed

(Information compiled from 100 clients seen at VAS between 6/84 and 6/85.)

Advantages and Disadvantages

One main advantage of the Vocational Assessment Services project is its cost effectiveness. VAS is able to deliver a high quality service without the overhead operating expense of an in-patient program. In 1985, project expenses totaled $50 per hour or a daily operating cost of $375. As previously defined, the out-patient office environment has also provided a psychological stimulus to the client's vocational attitude. The 1:1 client-evaluator ratio has been advantageous in offering the opportunity for subjective client observation. One objection which could be raised to this method is the limited opportunity for the client to interact with his/her peers. VAS staff believes, however, that even in a group testing environment there is limited opportunity for interaction because many times each evaluee is working on a separate work sample that does not require peer involvement. Also, the evaluator's time is shared among clients.

Because of grant funding, the project was able to assess and purchase some of the newest evaluational instruments. Having a wide selection of assessment tools has permitted the evaluator to tailor the vocational package to address the client's needs and to answer the referral source's questions. The implementation of the microcomputer into the project has proven to be time-saving. VAS has been able to decrease clerical support time from 7.5 hours per day to five hours per day. The availability of contracted support services from HOPE Consolidated Services, Inc., and the Williamsport Hospital Harry R. Gibson Rehabilitation Center has allowed the project to offer psychological and occupational, physical, and speech therapy services at VAS's location.

As with new projects, obtaining adequate referrals can be difficult. Being a rural location, the term "vocational assessment" was not well known. In an endeavor to disseminate information about the project, area service clubs, professional groups, special interest groups (e.g. head trauma and spinal cord support groups, local claims association, lawyers' club, etc.) were contacted. An informational program regarding vocational assessment and the abilities of the

physically challenged as workers was developed and offered for presentation. A logo was also designed to provide an identification symbol. This was then imprinted on stationery and public relations material. Reporters from newspapers and the area's radio stations were invited for tours. A before-work open house was held for area companies and attorneys. This time frame proved to be excellent.

Because the evaluation period involving the client's direct participation is usually limited to two days, it is possible to only see the client on a "good" or "bad" day regarding work skills and attitudes. Pain and/or behavioral problems can affect vocational test results. The evaluator always reserves the right to bring the client in for testing at another time. If behavioral problems are the issue, then a psychological evaluation could possibly be recommended.

The legal aspects of vocational evaluation are complex. Attorneys who have used VAS's services have expressed concern about the norming populations used to establish test standards. Questions regarding the reliability, validity, and applicability of test scores in direct relation to local rural populations are often asked. The only solution to this problem appears to be to continue to gather data and establish our own local norms when possible.

Another problem which faces all evaluators is that the client may not be cooperative. Reasons include: the client may lose benefits if he/she tries to return to work and it doesn't work out; the client may not want to get well "too fast" because he/she is involved in a court action; or the client may only have skills for an entry-level job and the pay may be lower than the benefits he/she is receiving. Solutions to these issues require concerted efforts by all involved parties. One solution may be to make arrangements with employers to offer the client a trial return-to-work period with no penalization of benefits. Insurance companies may also be willing to structure their wage loss payments to supplement the difference in income received by a client returning to work. Getting the client to participate in the vocational process as soon as possible after the disability assists in breaking the pattern of receiving financial gain for doing nothing. Individuals in the vocational field should also be aware of political activities transpiring that affect their area of expertise. We all have an obligation to let our elected officials know of our concerns and possible solutions.

Conclusion

Vocational needs of any population are constantly changing as job opportunities and technology change. Because of the isolation of the rural community, a concerted effort needs to be maintained to address these issues. Vocational Assessment Services has brought technology and expertise to this population group and has tailor-made a vocational assessment package, which focuses on the community's specialized needs and local job opportunities.

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MODIFICATIONS OF A CAREER INFORMATION DELIVERY SYSTEM FOR USE WITH HEARING-IMPAIRED PERSONS

PAULA MARUT, M.A.

Abstract

The increased presence of microcomputers and the easier public access to mainframe computers has created a new source of support for the vocational rehabilitation services to disabled persons. Numerous software packages have been developed to address a variety of issues for nearly every disability group, as well as multiply disabled persons of all ages. One such category of software development has been in the area of career information. A commonly used term for such packages is Career Information Delivery System (CIDS). The Arkansas Rehabilitation Research and Training Center on Deafness and Hearing Impairment is conducting a research project with a CIDS package being used in the state of Arkansas. The initial purpose was to determine if deaf persons could access this career information system and gain benefit from the information provided. As a result of this preliminary research study, a number of difficulties were identified by the study participants. The package required some modification in order to enhance its utility with this population. Two major modifications were effected to address difficulties experienced by hearing-impaired users participating in the study: 1. enhanced and increased amount of information appearing on the computer monitor. 2. program modifications added occupations deleted due to the hearing loss. Additions to the CIDS package included, information files listing and describing postsecondary programs and renabilitation facilities offering specialized support services for hearing-impaired persons thereby providing training information not previously delineated by the package.

Overview

Career information, exploration and guidance of deaf persons is made problematic by a variety of factors. Lack of personnel skilled in communicating with this group is a well known and pervasive problem throughout the field of deafness. Another problem and one to be addressed by this paper is the lack of appropriate career development tools proven effective when used with this population. The literature indicates that many deaf persons, especially those with additional disabling conditions are generally not exposed to the wide range of vocational opportunities available to them and subsequently tend to consider only traditional occupational areas in which such persons have been employed (Austin, 1974; Fitch, 1976; Watson, 1976; Schein, 1977; and Watson, et al., 1983b). A recent survey of career education programs conducted by the Research and Training Center on Deafness and Hearing Impairment (RT-31) identified career choice and planning as the most serious need of deaf students preparing to enter the labor market (Bullis and Watson 1985). Evaluators counselors and other professionals involved in the career planning efforts of their clientelle typically utilize a vocational interest inventory as one tool to aid in identifying jobs of interest to the job seeker. Most inventories employ two basic procedures. First, the individual is requested to make choices regarding how much he or she likes or dislikes specific activities, both vocationally oriented and in some cases activities of an avocational nature. Second, the resulting responses are compared to profiles of persons successfully employed in different occupations (Anastasi, 1976). With a few exceptions, most vocational interest inventories use lists of activities requiring the individual to make choices based on what they've read. Several issues are raised regarding this general technique. One, the average reading level of deaf persons is a 4th grade equivalent (Gentile, 1971; Furth, 1973; Moore, 1982). This level of skill would be insufficient to comprehend the choices presented by these inventories. Second, in order to complete these inventories an individual

has to have sufficient information about the activities they are choosing as liked or disliked. Because of the aforementioned lack of occupational knowledge on the part of this population as well as the substandard reading skills the appropriateness of these inventories is suspect.

Searching the literature for a viable alternative to the vocational interest inventory, The University of Arkansas Rehabilitation Research and Training Center on Deafness and Hearing Impairment (RT-31) identified the efforts of the National Occupational Information Coordinative Committee as a possible source of such an alternative.

Description of CID Systems

The National Occupational Information Coordinating Committee, (NOICC) was established as a result of the 1976 Education Amendment (P.L. 94-482) and was assigned the responsibility to . . . . "develop and implement an occupational information system at the Federal, State and local levels" (NOICC/SOICC 1982). Individual State Occupational Information Coordinating Committees (SOICC) were established in all 50 states as a result of this mandate. Subsequent amendments, the Youth Employment and Demonstration Projects Act of 1977 (P.L. 95-93), the Career Education Incentive Act (P.L. 95-207) and the Comprehensive Employment and Training Amendments of 1978 (P.L. 95-524) charged the NOICC/SOICC with the following responsibilities:

1. develop a standardized occupational information system (OIS) to serve the needs of vocational education and employment and training programs at local, State and Federal levels;

2. improve coordination and communication among the developers and users of occupational information;

3. give special attention to the labor market information needs of youth. (NOICC/SOICC 1982, pg. 1.)

Statewide Career Information Delivery Systems (CIDS) were developed in order to meet the requirements described above. As of October, 1984, forty-three SOICC's established a CIDS for their respective states. Each system shares a common group of basic objectives:

1. help students and clients learn about and understand the range of career opportunities presently available and those that are likely to be available in the future;

2. help entrants to the labor force become aware of occupations they would find acceptable and personally satisfying;

3. encourage persons in the process of career exploration and decision making to seek out vocational information on the their own;

4. increase awareness of major sources of occupational, educational and training information;

5. help people learn of educational and training opportunities and their relationship to occupations they may be exploring;

6. provide support for related programs, including career education, career and employment counseling, employment and training and educational planning (Dunn, 1982).

The Statewide Career Information Delivery System (CIDS) provides comprehensive national, state, and local information to individuals who are in the process of occupational exploration and/or a job search. By October, 1984 there were 13,406 institutional user sites in operation throughout the United States and territories. A variety of locations host these systems such as, educational institutions, employment security offices, employment and training centers, vocational rehabilitation agencies, libraries, business and industry etc. Thus assuring reasonably easy access to this system by the general public.

Each SOICC was given the freedom to develop their system according to their individual needs. The 43 CIDS currently in operation do, however, share a number of specific characteristics:

1. They are computer-based but possess multiple delivery modes.

2. They deliver national, state, and local career information to users.

3. They use, to the maximum extent possible, the pertinent data and information available through the occupational information system.

4. They utilize an accessing or search strategy that sorts and selects occupations that are compatible with client-identified variables.

5. They serve users in a wide variety of settings - secondary schools, postsecondary institutions, libraries, CETA facilities, job service offices, and vocational rehabilitation centers throughout the State.

6. They are effective with persons of varying ability and experience.

7. They foster interagency and intergroup cooperation at the organizational level.

8. They are financially supported by State and local funds after the termination of Federal developmental grant monies (Dunn, 1982, pg. 2).

Discussions with several CIDS developers, both state and commerical as well as NOICC staff indicated that there is a need for modifications to be made in the existing packages in order to make them accessible to hearing-impaired individuals.

Upon review of a variety of CIDS packages, both state and commercially developed, it was ascertained that basic similarities existed across all systems. This enabled RT-31 to choose one system for modification with the results being applicable to all. This study entitled "Development and Evaluation of Computerized Career Information Delivery Systems for Hearing-Impaired Individuals" has been and continues to be conducted by RT-31. In addition to demonstrating the feasibility of adapting existing CID systems for use with deaf persons, the study also identified those adaptations necessary for use with this group. Because RT-31 is located in Little Rock, Arkansas the CIDS currently used by the Arkansas SOICC was selected for investigation. The Arkansas Occupational Educational Information System (AOEIS) is an adaptation of the CIDS' developed by the Maine Planning Information System and the Michigan Occupational Information System (MOIS). The basic components of the AOEIS are:

A. The Structured Search which is designed to aid the individual in identifying interests and career goals via seven routes requiring specific decisions or choices. The seven choices comprise the individual's interest profile which will generate a list of occupational titles via a micro computer. This list of occupational titles can then be explored for the purpose of developing a career plan.

Areas to be investigated are:

1. Interest: Interest are defined in terms of a worker's preference for working with Data, People, or Things.

2. Areas of Work: Areas of work are defined in terms of broad career fields in which persons may be employed.

3. Physical Strengths: Physical strengths are defined in terms of lifting activities workers must perform.

4. Physical Capabilities: Physical capabilities are defined in terms of the physical abilities required of a person to perform certain job duties.

5. Working conditions: Working conditions are defined in terms of the physical surroundings in which workers perform their job tasks.

6. Education: Education levels are defined in terms of the normal training necessary to enter an occupation. There are ten levels of education from which to choose.

7. Temperaments: Temperaments are defined in terms of the types of situations persons must adjust to in a work setting.

Upon completion of the search, the searcher then selects occupations for further exploration. The AOEIS package uses microfiche cards as the information delivery medium. The information is presented under the following headings:

1. Occupation Title File

   There are currently 386 major occupations listed with more than 1,450 speciality occupations as subheadings.

2. Postsecondary Program File

3. Apprenticeship File

4. Postsecondary School File

5. Postsecondary Financial Aid Files

6 & 7. School Subject Files

Methodology

The intent of this study is to assess the accessibility of the CID system for use by deaf persons. In this case, the Arkansas package. Three main subobjectives are being addressed.

·Assess the understanding of those concepts presented in the CIDS by users who are deaf.

·Identify which, if any, modifications or additions are necessary to improve the accessibility of the CIDS by deaf persons

·Compile and/or develop any additional materials necessary to enhance the existing CIDS.

The Arkansas package was used as originally developed for one year with 46 deaf individuals. Several modifications and supplementary materials were identified as necessary based upon data gathered from the first year group.

1. Simplification of the vocabulary used in the Structured Search booklet.

2. Modification of the Physical Capabilities search route to reduce the number of job titles deleted via the Talk and Hear choice.

3. Increase the amount of information presented on the computer monitor.

4. Development of two additional microfiche files providing training information specific to deaf persons.

·Item 1 was modified by incorporating a more recent edition of the Self Directed Search provided by the original developers. Much of the vocabulary had been streamlined and the amount of information reduced thereby simplifying the search process.

·Item 2 involved altering the CIDS software in order to reduce the number of jobs eliminated due to selection of the not wanting to talk and hear item. Information derived from Rehabilitation Services Administration R-300 data on the placement outcomes of deaf clients closed as successfully employed during 1981 was used. Those occupations deleted by the original program based on answers related to talking and hearing were added based on successful vocational rehabilitation closures nationally.

•Item 3 also required program modifications. The amount of information appearing on the computer monitor was increased with intermediate steps added to enhance the user's understanding of the search process. Care was used to avoid vocabulary and sentence structures identified as causing difficulty for deaf users.

•Item 4 represents the development of two microfiche files. The Arkansas package provided training information on instate programs only and did not identify which, if any programs offered support services needed by deaf students/trainees. Both files offer information about programs nationally and delineate training and support services available to these students. The two files are, National Postsecondary Schools offering Services to Hearing-Impaired Students and National Rehabilitation Programs Offering Vocational Training to Hearing-Impaired Persons.

These modifications and additions have been used with a second group of deaf persons. The results of this effort are currently being analyzed and further information regarding this study should be available by September of 1986.

Should the findings indicate that the modified CIDS package can be more effective when used by deaf individuals, the findings and materials will be submitted to the National Occupational Information Coordinating Committee (NOICC) for dissemination to participating SOICCS. Because the AOEIS package is basically similar to the other 43 CIDS (e.g., structured searches, based on DOT worker trait groups, etc.), the findings should be of interest to the other 13,000 plus user-sites. The CIDS is already developed and updated annually by 43 states and is readily available in more than 13,000 user-sites, making it easily accessible for use by programs serving deaf individuals in other states.

Project staff will disseminate the findings of this research investigation to both, other CIDS user-sites (through NOICC), and to the field of deaf education and rehabilitation. Additionally, RT-31 encourages all CIDS developers to incorporate these modifications into their respective systems. The changes and modifications will in no way interfere with system utility by normally hearing users and may aid those persons with poor reading skills.

Summary

Ten to fifteen thousand deaf persons are served by the 50 State VR agencies each year. As the preceeding paper suggests, deaf persons generally lack access to the timely and accurate occupational information needed to make informed career choices and decisions in their rehabilitation program. Furthermore, although an extensive system of CIDS are available (i.e., in 43 states and 13,406 CIDS user-sites) throughout the country, needed adaptations have not been made to make the systems readily accessible and of utility to deaf rehabilitation clients. We can generally anticipate good results from rehabilitation technology which take into account the particular needs of the deaf user. First, however, the computer technology and systems used in computer-assisted CIDS must be adapted to accommodate and address the career information needs of this group. The Research and Training Center on Deafness is available to serve in an advisory capacity for any CIDS developer interested in employing any of the modifications described in this paper.

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DELIVERY OF VOCATIONAL EVALUATION SERVICES TO DEAF PERSONS: RESULTS OF A NATIONAL SURVEY

PAULA MARUT, M.A.

Abstract

Vocational evaluation services are important components in the rehabilitation process, but pose special problems for hearing-impaired persons. Due to their unique communication requirements, additional knowledge and skills are required on the part of professionals providing services to this population. Thousands of rehabilitation facilities exist across the United States, many of them offering vocational evaluations as well as a variety of other services to these individuals. Until a national survey of rehabilitation facilities was conducted by the Arkansas Rehabilitation Research and Training Center on Deafness and Hearing Impairment there was no organized body of information describing the availability of specialized rehabilitation services needed by hearing-impaired persons. This survey contacted over 4,000 rehabilitation facilities nationally with 221 of those facilities offering some combination of specialized services to deaf and hard-of-hearing individuals. This paper will focus on those items dealing with the provision of vocational evaluation, and adjustment services to this population.

Rationale and Overview

Assessment and adjustment services, in all of their various forms, represent a major component of the vocational rehabilitation process (Bolton, 1982). The primary purveyor of these and other related services is the vocational rehabilitation facility. These facilities work with wide varieties of disability groups and offer a considerable number of different services to these individuals (Czerlinsky & Gilbertson, 1985). One such population consists of persons with impaired hearing. There are significant variations in how these facilities choose to offer evaluation and adjustment service to their hearing-impaired clientele. This is true both in terms of variety of services as well as number and kinds of staff available to serve this client group. This is particularly true with regard to staff skilled in use of the communication modalities used by such persons. Additionally, while some sectors of the country have many high quality evaluation and adjustment services, others are lacking same.

Until recently, deaf individuals, their families and rehabilitation personnel in the various states frequently discovered an absence of any kind of directory or related descriptions of the scope and location of the facilities which were needed when seeking specific combinations of services. Too often this resulted in inappropriate, or even no services being provided to a deaf person needing evaluation and/or adjustment programming. This was frequently the case even though there were and continue to be a number of highly qualified and effective programs available to these persons.

During 1982 and 1983, the Rehabilitation Research and Training Center on Deafness and Hearing Impairment (RT-31) conducted a national survey of programs offering vocational evaluation and/or adjustment services. Over 4,000 facilities were surveyed with 221 respondents meeting the survey criteria. That criteria being, offering one or both of the above listed services in some capacity and serving 10 or more deaf persons annually.

The initial product resulting from this effort was a 1985 publication entitled The National Directory of Rehabilitation Facilities Offering Vocational Evaluation and Adjustment Training to Hearing-Impaired Persons (Marut et al., 1985). The second objective, currently in progress, is to analyze the availability and patterns of services being provided to deaf rehabilitation clients across the country. This paper will give a general overview of the survey results from a national perspective. A more detailed report regarding the survey results will be available from RT-31 by Autumn 1986.

Results

The 221 facilities meeting the previously described criteria were fairly evenly distributed across the 10 Rehabilitation Services Administration (RSA) Regions. Table 1 provides a breakdown of number of facilities by region. Of the 50 states and District of Columbia, four states had no facilities represented in the study (Mississippi, Montana, Nevada, and South Dakota). This is not to say that no facilities responded from these states nor that they do not offer services to deaf persons, but that no respondents met survey criteria.

Table 1
Number & Percent of Programs
by RSA Region

Region	# of Programs	% of Programs
1	13	5.8
2	25	11.3
3	22	9.9
4	36	16.2
5	44	19.9
6	25	11.3
7	12	5.4
8	13	5.8
9	20	9.0
10	11	5.9

When asked to describe themselves, the largest number of programs identified themselves as vocationally oriented. About one third of the 214 programs answering the question requesting program type described themselves as comprehensive rehabilitation center, usually with a sheltered workshop. The next most likely description was by center which described themselves as provocational and/or work activity centers. Various types of medically oriented or educational programs make up the remainder of the facilities responding to this question. Table 2 provides a breakdown of the types of programs by number and percent. The figures are based on 214 respondents with some checking more than one descriptor.

Table II
Number and Percent of Programs by Type

	N	%
All Programs	214	____
Comprehensive	67	31.3
Prevocational	45	21.0
Sheltered Workshop	67	31.3
Work Activity Center	47	21.9
Vocational Evaluation Center	20	9.3
Speech/Hearing Center	31	14.4
Hospital	21	9.8
Postsecondary Program	25	11.7
Secondary School	24	11.2
Other	85	39.7

7 programs did not respond

Table 3 provides an itemization of various kinds of evalution and adjustment related services offered and the average number of deaf persons receiving these services annually per program. The 127 facilities reporting the provision of vocational evaluations served an average of 25 deaf people each and an average of 61 deaf persons received personal social adjustment services in each of the 132 facilities. Typically, the average number of deaf persons receiving each of these services annually ranges from about 25 up to almost 60.

Table III
Number and Percent Programs Offering Service and Average Number of Deaf Persons Receiving Service in 1982 - Nationally

Service	% Programs Offering Service		Av. # Deaf Persons Receiving Service
	N	%	
Vocational Evaluation	127	61.7	25.0
Psychological Evaluation	94	45.8	34.0
Personal-Social Adjustment	132	65.0	61.6
Work Adjustment	117	57.3	25.4
Independent Living Skills	100	49.2	58.6
Career Education	77	37.9	32.7
Adult Education	70	34.3	21.3
Vocational Trade Training	77	37.9	19.1
Job Seeking Skills	124	60.7	48.1
Job Placement	114	55.8	29.6
Sheltered Workshop	75	36.9	6.1

Obviously, a wide variety of professionals are necessary to provide these services regardless of the disability group or groups served. In addition to being well trained in their respective disciplines, staff working with a deaf clientele ideally need to demonstrate competency in manual communication skills. American Sign Language requires the equivalent amount of time and effort to master as would any foreign language. Finding persons possessing these dual qualifications is difficult and in many instances interpreters are hired in lieu of requiring professional staff to learn sign language. Table 4 presents breakdown of number of staff available in a variety of positions and the average number and percent of staff with degrees in a deafness related field. The figures represent the number of paid staff in each position and decimals reflect part time positions.

Table IV
Reported Average Number of Each Type of Staff and Staff With Degrees in Deafness Nationally in 1982

Staff	Average # Staff	Average # Degree in Deafness	Average % Degree in Deafness
Counselor	2.4	.3	23.4
Case manger	1.7	.1	12.1
Social worker	1.0	.08	13.0
Psychologist	1.0	.05	8.6
Vocational Evaluator	1.2	.07	9.6
Career Educator	.55	.03	15.1
Adult Educator	.6	.2	21.1
Work Adjust. Specialist	1.0	.05	10.2
Job Placement Specialist	1.0	.1	14.7
Production Supervisor	1.3	.01	5.0

Summary

Previous to 1982 the field of deafness rehabilitation had no organized resources available to help professionals, deaf individuals and their families locate services outside of their immediate geographic locality. Nor has there been any study addressing rehabilitation programs serving deaf persons on a national level. As a result of this survey the Research and Training Center on Deafness published the National Directory of Rehabilitation Facilities offering Vocational Evaluation and Adjustment Training To Hearing-Impaired Persons in 1985. This publication is the first such document outlining the availability of services to this population on a national basis.

The survey of more than 4,000 rehabilitation facilities identified 221 programs serving deaf persons. There were some variations noted as to the geographic distribution, though all RSA regions had some programming available. The larger variations occured in the kinds of services available within these programs. Some programs only offered a few services while others provided clients a full range of rehabilitation services. Additionally, the number of staff qualified to serve this population was less than would be needed to serve the numbers of persons receiving the corresponding services.

Additional analyses of these and additional issues are currently being conducted by RT-31. The above overview should serve as a basic introduction to the larger report (Delivery of Vocational Evaluation Services to Deaf Persons: Results of National Survey) which will be available by Autumn of this year.

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THE EFFECT OF ATTORNEY INVOLVEMENT IN THE WORKERS' COMPENSATION SYSTEM ON TIME, BENEFITS COST AND RETURN TO WORK

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Efforts to maintain Workers' Compensation costs at a minimum while providing maximum medical, weekly benefit, and vocational services to a state's industrially injured workers are a continued concern for all Workers' Compensation administrators. Workers' Compensation systems are continually evolving into more complete, cost effective programs. Of great interest in recent years to all persons involved in Workers' Compensation systems is the effect of the attorney in regard to lost time claims. It has been assumed that the attorney may have a great impact on the overall function of most Workers' Compensation programs. This study was designed using Georgia Workers' Compensation cases to determine the degree of impact of the attorney on the outcome of Workers' Compensation cases in regard to time, costs and return to work. Significant results using empirical procedures were obtained and documented. Clearly this data is gives an indication that some of the historical and current goals of Workers' Compensation legislation are not being met. Suggestions for administrative and claims practices improvements which may affect the need for high attorney involvement in Workers' Compensation systems will be discussed. The implications this research may have on service provision and marketing in the field of vocational rehabilitation and vocational evaluation in the private sector will also be discussed.

At the turn of the century, a common law ruled in regard to industrial accidents. Epstein (1982) described this law as "an ironclad rule of breathtaking simplicity." He further interpreted this common law as follows: "no employee could ever recover from any employer from any workplace accident - PERIOD" (Epstein, 1982). It was understood that: (a) the employee assumed the risk of injury at the time of employment, (b) the employer owed the employee no care, and (c) the employer was free of legal accountability (Epstein, 1982). However, due to growing needs of the industrially injured members of the communities throughout the United States, legislation was written in an effort to relieve injured workers from growing financial, medical and vocational burdens. These first legislative efforts required an employee to go through the courts to provide proof of employer negligence to receive compensation. Mallard (1979) claims that 75% of industrial injuries were due to working conditions or employer negligence, but only 15% of these cases were compensated through the courts, usually after long court proceedings and delays.

In 1906, Congress passed a compensation law for interstate railroad employees. This law removed employer negligence and assumption of hazzard as grounds for noncompensation (Chiet, 1961). In 1911, the first workers' compensation law was passed in the United States. By 1920, all but six states had passed workers' compensation laws. These laws were the beginnings of modern workers' compensation legislation. The early workers' compensation legislation had six objectives. Briefly, these objectives included: (a) provide prompt, sure reasonable income and medical benefits regardless of fault; (b) provide a single remedy and reduce court delays and costs; (c) relieve charitable organizations of financial drain; (d) eliminate payment of fees to attorneys and witnesses as well as time consuming trials and appeals; (e) encourage employer interest in safety and rehabilitation; and (f) study the causes of accidents in efforts to reduce future accidents and suffering. These laws were disigned to take liability from the employer and to make compensation costs a part of production. The economic losses were to be absorbed in the price of the product or service provided.

The two decades beginning in 1908 and ending around 1928 laid the ground work for vast improvements in state workers' compensation programs (Larson, 1963). In the decades following 1928, progress in program improvements slowed down considerably. Several studies have been designed using state workers' compensation programs since the 1960's. In general, the results of each of these studies revealed a set of similar recommendations. These recommendations include: (a) broader coverage, (b) provision of protection against interuption of income, (c) provision of sufficient medical care and rehabilitation, (d) encouragement of safety, and (e) provision of an effective system for delivery of benefits (Conley & Noble, 1982; Thompson, 1979).

A comparison of the goals of the 1920's workers' compensation legislation as listed above and the recomendations for state workers' compensation programs published during the 1960's and 1970's reveal great similarities. How much progress has workers' compensation programs made in recent years? Thompson (1979) designed a study to determine if states were providing adequate, prompt and equitable services. Some improvements were cited between 1972 and 1977 comparisons. However, the United States Department of Labor Workmen's Compensation Administrative Organization and Cost Administration (1966) found that the development of workers' compensation programs had not kept pace with the social and economic advances of the American people.

Employer costs for workers' compensation premiums have managed to surpass the other advances in service provision (Compensation Review, 1982). Employers paid an average of $2.70 in workers' compensation premiums for every $100.00 of payroll to protect employees from occupational hazzards in 1982 (Compensation Review, 1982). Benefits paid to injured workers have increased substantially in recent decades. From 1940 to 1980 the total benefits paid for injured worker claims have risen from .16 billion dollars to 11.20 billion (Thompson, 1982).

While employers and insurance companies are concerned about rising costs of insurance premiums and workers' compensaion claims, injured employees have concerns as well. An industrial injury may result in physical, emotional, social and vocational difficulties (Fox & Company, 1982; Brodsky, 1977; Treon, 1979). In addition, injured workers receive monetary benefits leaving them with reduced income levels after the injury. The laws are designed in this manner to keep costs down and prevent fraud against the system. Although both the employer and employee receive some benefits from these laws, there is no way to have ideal incentives in a workers' compensation case for the employee and the employer simultaneously so long as the set of possible outcomes is limited to a regular payment from employer to employee once the accident occurs (Epstein, 1982). For this reason, the claimant attorney has become an integral part of every workers' compensation system. The claimant attorney has been seen by some as the antagonist of the insurance company and employer, encouraging costly and timely delays, increased medical and weekly benefit costs, settlement costs, and lower return to work probabilities, as well as creating ill will between employers and employes. Treon (1979), a plaintiff attorney states "I am, in my own objective disinterested way, extremely biased and prejudiced in favor of whomever employs me. I am not guaranteed payment for my opinion, whatever the outcome of the case-I only get paid when I win." He also states that although an attorney on contingency fee stands to earn more the longer a client is out of work, blatant conflicts exist between quick resolution of a case and a lawyer's economic self-interest. These conflicts include the ethics code, receipt of payment after settlement, and injured worker and family pressure regarding return to work (Treon, 1979).

Workers' compensatiion systems were designed not as liability plans, but as no-fault coverage plans to avoid litigation and assume prompt payment of benefits to workers. Antagonistic relationships between employers, insurance companies, and injured workers, and a high degree of attorney involvement in unlitigated and uncomplicated claims are not consistent with the no-fault liability concept that workers' compensation programs are theoretically designed from.

Minimal research has been done on the effects of attorney involvement in the field of workers' compensation. Much of the speculation about attorney involvement has been made without appropriate evidence to justify the conclusions drawn. An excessive amount of attorney usage in the United States may be attributed to some problems areas commonly found in state workers' compensation programs. These problem areas have been identified and published recommendations for system improvements have been cited above. This study has attempted to define some of the parameters of the effects of claimant attorney involvement in the workers' compensation system. The parameters

reviewed include time and cost variables, and return to work probabilities.

RESEARCH METHOD

SUBJECTS

Data were obtained from a computer generated random sample of approximately 45,000 workers' compensation files from the Georgia State Board of Workers' Compensation. All cases were open for a minimum of 60 days and closed in the calandar year of 1982. The final two digits of the social security number was used to generate the sample. Cases were selected in this manner until the desired sample size was reached. A total of 1809 cases were reviewed. Of that total, 606 cases had attorney representation. Data were collected for the variables of time in days from date of injury to date of closure, medical costs, weekly benefit costs, settlement costs and case closure employment status,and social security number.

METHOD OF DATA COLLECTION

Data sheets were prepared in advance for each case file examined. These sheets provided space for the social security number, date of injury, date of closure, medical costs, weekly benefit costs, settlement costs, vocational outcome, and attorney involvement. Each case file was manually searched to retrieve the required data. The information obtained from each case file was coded and transfered to data sheets. Subsequently, the information from the data sheets was transfered to computer cards for analysis using the Statistical Analysis System (SAS).

PROCEDURE

TIME AND COST VARIABLES

The time from date of injury to date of closure was measured in months. The medical, weekly benefit, and settlement cost was measured to the nearest dollar. Four one-way Analysis of Variance procedures were performed to test the time and cost variables.

VOCATIONAL OUTCOME GROUPS

Vocational outcome was divided into two groups: employed and unemployed. Vocational outcome was measured in terms of the presence or absence of attorney involvement and employment status at the time of case closure. A chi-square analysis was performed to test the vocational outcome variable.

RESULTS

The 1982 Georgia State Board of Workers' Compensation case statistics were used to test representativeness of the sample drawn. The sample characteristics and known population characteristics varied by less than one percent in descriptive variables such as gender and age (Georgia State Board of Workers' Compensation Annual Report, 1982-1983). These negligible differences led to the conclusion that the sample was representative of the entire population of industrially injured workers in the State of Georgia.

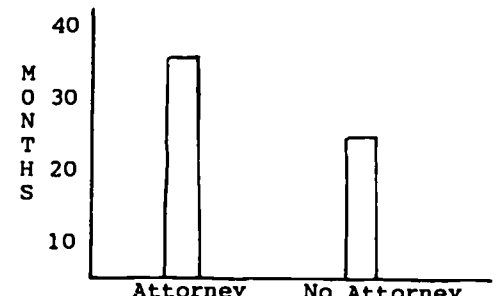
A series of one-way Analysis of Variance (ANOVA) procedures were used to assess the time variable from date of injury to date of closure and the medical, weekly benefit, and settlement cost variables. These variables individually served as dependent measures with the presence or absence of attorney involvement serving as the two level independent variable for each ANOVA. If the presence or absence of attorney involvement was not related to the time and cost variables, then no significant differences would be expected from the statistical analysis. Significant ANOVAs would reflect relatedness of the independent and dependent variables.

To assess the affect of attorney involvement on the employment status of injured workers, a chi-square analysis was conducted. If attorney representation was equally distributed among all injured workers, return to work frequencies would reflect equal proportions of employed and unemployed claimants. A non-significant chi-square would be expected. Significant chi-square values would be indicative of disproportionate observed frequencies of attorney representation among the two levels of the employment status variable.

An alpha level of .05 was observed throughout the investigation to determine statistical significance.

Significant differences ($F=18.42$, $p<.001$) in time from date of injury to date of closure for claims with legal representation and for claims without legal representation were found (see Figure I). According to the sample data, claims with attorney representation remained in an active status for longer periods of time than claims without attorney representation.

Figure I



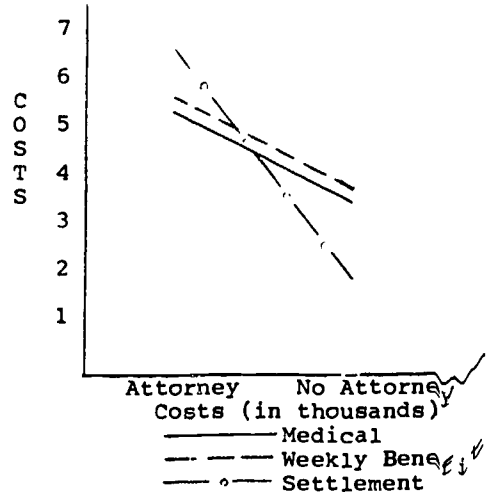
Time from date of injury to date of closure.

Significant differences (p<.0001) in medical costs for worker claims with legal repre and injured worker claims witho representation were found (se II). According to the test s medical costs were significantly in cases where claimants attorneys for representation.

Significant differences (F= .0001) in weekly benefit co injured worker claims with representation and injured worke without attorney representatio Figure II). Weekly benefit co significantly higher for compensaton cases where retained attorneys for represent

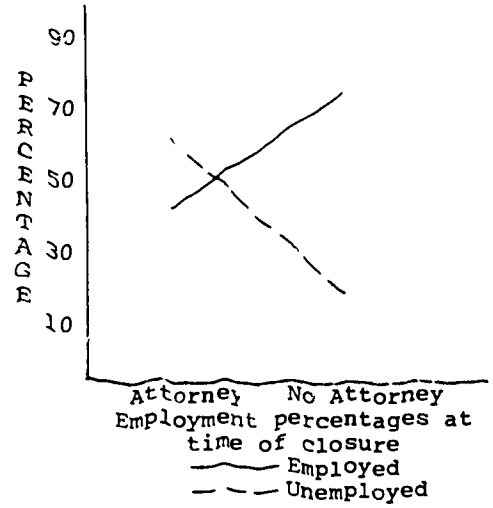
Significant differences (p<.0001) in settlement costs fo with attorney involvement and fo without attorney involvement (se II). Settlement costs were signi higher in cases where claimants attorneys for representation.

Figure II



There was a difference (ch value=246.504, df=1, p .0001) in to work frequencies based on pres absence of attorney representati Figure III). The data sugges there is a relationship between presence and a lower percent successful return to work claim data also suggests that there relationship between attorney abs an increased probability of su return to work.

Figure III



Each hypothesis revealed significant differences in the time, cost, and return to work variables for workers' compensation claims based on presence or absence of attorney involvement. These data revealed a relationship between attorney involvement in workers' compensation claims and higher than average time frames from opening to closure, higher than average medical, weekly benefit and settlement costs, and a reduced probability of return to work.

DISCUSSION

In workers' compensation cases represented by attorneys, time was a significant factor with represented cases open an average of ten months longer than cases without attorney represenation. This equates to a 29% increase in open case time.

The average total cost for claims without attorney representation was $9,700.00 over a 24 month period. The average cost of claims with attorney involvement was $17,300.00 over a 34 month period. Financially, this $7,600.00 difference represents a 44% increase in claims costs.

In the development of this study an assumption was made that the average costs of claims in terms of weekly benefit and medical expenses would be higher for cases with attorney representation. Medical costs for cases with attorney involvement were $5,100.00. Those cases without representation totaled an average of $3,700.00 in medical costs; a difference of $1,400.00 or an approximate 25% increase. Weekly benefit costs for claims with attorney involvement were $5,600.00. Those cases without representation totaled an average of $3,900.00 in weekly benefit costs; a

$1,700.00 difference or an approximate 25% increase.

In Georgia, price ranges for settlement deviations are partially determined by the treating physician's documentation of physical impairment. This impairment rating is based on guidelines published by the American Medical Association (AMA). The claimant's geographic location of residence, the surrounding labor market, age, work history, and the probability of return to work are also factors involved in determining settlement price ranges. It was felt that attorney representation would have a positive correlation with higher settlement dollars. The average settlement cost for claims with attorney involvement was $6,600.00 as opposed to $2,100.00 for claims without attorney involvement. This revealed an average difference of $4,500.00 dollars resulting in a 66% increase in settlement costs. Most attorney fees range from 25 to 33 1/3% of the settlement dollar. After attorney fees, claimants draw an average of $4,400.00, just over twice the amount of money received in settlements without attorney involvement. The settlement cost difference seems to be directly related to the expertise of the attorney in regard to compensation law and arbitration.

Returning to gainful employment is the ultimate goal for most injured workers in state compensation systems. In cases without representation, seventy-five percent of the claimants had returned to work within a 24 month average time period from the date of injury to the date of closure. However, only forty percent of claimants with representation had returned to work during the 36 month average time period from date of injury to date of closure. Thirty-five percent more claims were settled with the claimant working in one-third of the time period when comparing the return to work rates of claimants with and without attorney involvement. This data revealed that there was a relationship between attorney representation and a reduced percentage of successful employment situations for injured workers.

The data regarding increased weekly benefit and medical costs also revealed a relationship with attorney representation. However, this data may very well be a reflection of the difference in the time frame from date of injury to date of closure for cases with and without attorney representation. The percentage of increase in the weekly benefit and medical benefit costs are consistent with the percentage of time increase. The return to work variable may also be related to time. It is well documented that the probability of successful return to work is reduced as time from the date of injury increases without resolution (Gogstad, 1968; Sternbach, 1968; Fox & Company, 1982; Alfano, 1973).

STUDY RECOMMENDATIONS

The data reveal that timely service provision may aide in the reduction of medical and weekly benefit costs and increases in the probability of claimant return to gainful employment. It is felt that the reduction of costs by time efficient service provision would also aide in the stabilization of escalating workers' compensation insurance premiums.

It is felt that current laws exist across the nation which theoretically provide for timely, efficient and cost effective compensation related services. However, due to factors such as variable claims practices, negative attitudes, and lack of education regarding workers' compensation in general; claimants often turn to the attorney for help in benefits provision and understanding the process. Service provision in shorter time frames may aide in the delivery of benefits consistent with the goals of workers' compensation systems.

Alleviation of some of the causes of untimely case management and high claims costs could aide in greater efficiency in the processing of compensation claims by insurance companies. Effective claims handling may be a key factor in controling excessive use of attorneys in workers' compensation systems. Claims persons are often so busy that their primary function is to "put out fires". Oftentimes performing essential activities to ensure smooth claims handling is postponed in favor of completing tasks requiring immediate attention. This can be a crucial factor in both employer and claimant understanding of the compensation process and their expectations for benefits provision. Time spent educating the claimant in the compensation process may alleviate some of the confusion claimants feel once they have been injured and have begun to lose work time. This may result in less frequent attorney usage by the injured worker.

Other reasons for seeking representation may stem from attitudes of employers and insurance commpany personnel regarding long term lost time cases. Many times injured workers are considered malingerers who have willingly accepted the lifestyle of a non-working disabled individual. This perception is often "confirmed" in the eyes of employers and insurance representatives upon claimant retainment of an attorney for representation.

Rehabilitation Involvement. It is felt that many of the reasons workers' compensation recipients turn to attorneys can be dealt with effectively by the rehabilitation specialist. Some of these

reasons include: (a) fright regarding physical illness, (b) documentation of financial needs, and (c) embarrassment and depression due to unemployment or disability. Rehabilitation specialists can provide medical management services and explanations of the goals of medical procedures and treatment to the claimant's understanding. When claimants experience financial distress as lost time from work accrues, the rehabilitation coordinator can provide financial counseling. An objective opinion regarding financial needs of claimants can be helpful to claims personnel in determining appropriate actions regarding a claimant's financial situation. Lindley (1981) stated that all injuries also have an effect on the emotions of a person. Vocational rehabilitation coordinators have training in interpersonal counseling skills. As trained counselors they are able to help claimants in dealing with the emotional aspects of their injuries.

Oftentimes the vocational rehabilitation process is enhanced by the use of techniques such as job analysis and labor market surveys as well as processes such as vocational evaluation. These activities aid a workers' compensation recipient in developing goals and appropriate alternatives regarding return to work activity. The early development of return to work goals may result in increases in injured worker motivation and a positive perception of a teamwork approach to positive resolution of the workers' compensation claim. Rehabilitation specialists often provide injured workers and employers alike with educational information regarding workers' compensation operations. This educational activity may enhance a teamwork approach toward effective service provision and return to work. This may result in the avoidance of adversarial feelings between the different parties involved in workers' compensation claims.

In summary, recommendations for controlling excessive attorney usage include adherance to current state workers' compensation laws as well as continued empirical research regarding causality of attorney usage and appropriate alterations to workers' compensation law, administration, and claims practices as the need is documented. The full use of professional services available to injured workers and employers such as rehabilitation and safety management is strongly encouraged as these services have been empirically proven to be cost effective and successful.

SUGGESTIONS FOR FURTHER STUDY

The results of this study reveal that there are significant increases in time and costs, and a significant decrease in return to work in workers' compensation cases with attorney representation when compared with cases without representation.

Complicated litigation or issues involving greater injury severity may account for longer time frames between the date of injury and case closure, as well as increased medical costs. In an effort to document causality regarding any of the issues discussed in this paper, additional empirical evidence must be obtained.

It is felt that complicated litigation such as compensibility questions and change of medical condition which might require intervention of a third party should be the primary reasons for claimant retention of attorneys for representation. An interesting study could be designed to compare the number of litigated and unlitigated cases by attorney presence or absence. This type of study would provide information in regard to the effect of the litigation process on attorney retention. Differences in frequencies here may reveal attorney usage in excess of ideal need in the workers' compensation system.

Another interesting study could be designed comparing attorney representation in states where adherance to Thompson's (1979) study recommendations was high and in states where adherance was low. Such a study may reveal a difference in attorney representation patterns based on the degree of state compliance with national recommendations for state workers' compensation system improvements. Reasons for increased amounts of attorney usage in states may be due to ineffective legislation or poor administration of workers' compensation laws in a particular state. If ineffective legislation or poor administration is consistent with a higher attorney retainment rate in a state system, changes in legislation and the subsequent implementation of new or different service provisions can be made.

In addition, a questionaire could be developed to determine the claimant's reasons for the decision to obtain an attorney for representation. With a questionaire, data could be gathered directly from the source of the request for representation.

CONCLUSIONS

Expedient, efficient, and effective workers' compensation programs are the goals of compensation legislation. The cost of workers' compensation claims and premiums are a continued concern for insurance companies and employers alike. Protection against job loss, economic hardships, and vocationally disabling

medical and psychological conditions of the injured worker are primary legislative concerns. Periodic and appropriate reviews of factors which may be related to the cost and effective operation of workers' compensation programs are necessary to address the concerns of employers, injured workers, and insurance companies. Only after thorough reviews of appropriate factors have been made can steps be taken to improve service provision in workers' compensation programs.

With the implementation of some of these suggestions, perhaps the claimant's perception of the need for the retainment of an attorney for representation will be reduced. These suggestions include: (a) continual empirical research in regard to the effectiveness of the administration of the state laws, (b) legislative changes aimed at reducing litigation problems and claimant probability of attorney retainment, (c) encourgement for insurance companies to provide education to employers and workers in the goal and purpose of workers' compensation to alleviate ignorance of system operations, (d) reduced claims adjuster caseloads, (e) early referral to rehabilitation, (f) increased public knowlege of the role of the administrative board, (g) increased employee awareness of resources other than the legal profession when questions regarding the provision of benefits and claimant rights are raised, and (h) premium discounts for employer implementation of regularly scheduled safety programs.

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Training Opportunity Profile for Visually Impaired Persons (TOP-VIP): A Resource in Vocational Evaluations of Persons with Visual Impairments

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Abstract

TOP-VIP (Training Opportunity Profile for Visually Impaired Persons) is described. TOP-VIP is composed of a varie[illegible] of self-assessment, career exploration, and [illegible]rk sample exercises designed to be used to assess visually impaired (and other persons) individuals for entrance into training in counseling/social work, sales, management, allied health, and computer programming.

Introduction

In recent years a number of problems have been identified related to a variety of important issues in vocational assessment of disabled persons. These include: (1) the utility and meaning of normative data for work samples (Bottesbusch, 1985); (2) limited materials available for experimental vocational assessment related to entrance into training for skilled technical, and professional positions (Peterson, 1985); and (3) vocational evaluation of severely physically disabled individuals including blind persons (Peterson, 1984-85). For the last four years, a research and development project has been conducted at the Rehabilitation Research and Training Center on Blindness and Low Vision (RRTC-BLV) at Mississippi State University to develop experiential vocational assessment materials adapted for use with blind and visually impaired persons that would further use a criterion-referenced, competency-based approach to vocational assessment adapted from assessment centers in business and industry. This article briefly describes that project and the materials developed.

TOP-VIP: An Overview

TOP-VIP includes vocational assessment and exploration materials adapted for use with visually impaired persons that related to five clusters of jobs; (1) counseling/social work; (2) management; (3) sales; (4) allied health; and (5) computer programming. Materials include:a Technical Manual; an Assessor Manual for each of the five job clusters; and a Participant Manual for each of the job clusters that is available in three formats to facilitiate the most appropriate administrate on to the blind or visually impaired individual: (1)

1.0 Orientation and Career Information Module	2.0 Orientation Interview
3.0 Psychological Test, etc.	4.0 TOP-VIP Assessment Techniques
5.0 Counseling and Feedback Interview	6.0 Additional Related Experiences

7.0 Case Staffing	8.0 Career Development Plan Formulation

braille; (2) print; and (3) audio cassette tape.

TOP-VIP is designed to be used by vocational evaluators and other rehabilitation professionals who work with blind and visually impaired persons who may be interested in pursuing training and employment in the five case clusters. Specifically, the materials are intended to (1) provide occupational information and occupational exploration experiences that will assist the visually impaired individual to gauge his or her interest in career clusters; (2) provide information concerning alternative techniques to sight that visually impaired persons may use in performing activities in work positions and allow the individual opportunities to experience use of these alternative techniques in the context of job related work tasks; (3) assess the skills of the visually impaired persons on behavioral dimensions that are important for entrance and success in both training programs; and (4) facilitate personal decision-making by the visually impaired individual concerning his or her interest in and potential for employment in counseling and/or social work. A systematic process for the use of TOP-VIP materials has been developed that can be incorporated into the total vocational evaluation process. This is described graphically below.

DEVELOPMENTAL PROCEDURES FOR TOP-VIP

A systematic process for the development of materials was used. This procedure is described below.

1. A Review of literature provided guidelines for the development of these materials. Both assessment center and vocational evaluation literature was reviewed regarding assessment center and work sample development. This review resulted in a monograph (Peterson, et al, 1984) that identified major needs in vocational evaluation of blind persons.

2. The job cluster was specified. This included an identification of the general field and an identification of specific DOT job titles that could be considered representative of the job cluster. Occupations were chosen that represented good opportunities for blind persons.

3. Analysis of the job cluster. An analysis of the job cluster was conducted that included: tasks of the jobs; skills and characteristics need by individuals entering training and performing job tasks; and methods of job accommendation used by visually impaired persons. Information was obtained by: (1) reviewing published studies and literature including the Dictionary of Occupational Titles and job analyses conducted by the Vocational-Technical Education Consortium of States (V-TECS) and other sources; (2) conducting job analysis interviews with sighted and visually impaired workers and trainers; (3) review of research related to skills and characteristics including professional competency studies.

4.. Development of dimension statements, definitions, and behavioral examples. Information in #3 was synthesized to identify major clusters of behaviors important for entrance into and completion of training and for ultimate success on the job. Rating scales and guidelines were developed, too.

5. Assessment exercises was then developed that would assess primary dimensions described in #4 above. Guidelines for final selection and development of exercises included the following: high face validity related to the occupational area; measurement of at least three to five dimensions in each exercise; and assessment of each dimension at least twice. A dimension/exercise matrix was used to assist in this process. Assessment exercises were developed with the innut from professionals in the field.

6. Manuals were developed, edited, and revised.

7. Materials are now being field-tested and initial interators reliability studies conducted via graduate students at Mississippi State University, staff of the Talladega Institute by vocational evaluators of the blind in the Southeast region of the United States, and review of dimensions and exercises by an Occupational Expert Committee for each of the five career clusters.

8. Criterion-referenced standards are being developed. Trainers and educators are being surveyed via a national survey concerning the skill level on dimensions that would be expected of individuals prior to or early in their training program. Additionally, the Department of Labor's job analysis of the traits and their levels that could be demonstrated on each exercise. Relevant "accommodation skills" for blind persons - e.g. use of braille, etc. - was also described based upon a review of the literature, job analysis interviews, and consultation with experts in the field.

9. Publications of Materials. These should be available from the RRTC-BLV, P.O. Drawer 5365, Mississippi State, Mississippi 39762 (601) 325-2001.

Assessment Exercises for Each TOP-VIP Job Cluster

Each TOP-VIP module is designed to provide experiences that will allow a visually impaired person to be involved in job related tasks and be assessed on important occupational dimensions. Assessment exercises in each module are summarized below:

Counseling/Social Work

Orientation and occupational information. This section provides an overview to the counseling and social work assessment process; information on occupations, career ladders, salaries, and projections on the availability of jobs; information on the variety of counseling and social work jobs performed by visually impaired persons and the alternative techniques to sight used in performing these jobs and a description of training opportunities and behaviorial dimensions important in training and on the job.

Simulated interview. The simulated interview is structured in three major parts: (1) a simulated interview in which the participant conducts an initial counseling interview with a role-ployed client; (2) development of a short report documenting the interview; and (3) discussion and feedback interview between the assessor and participant.

In-basket. A series memos and activities are presented to the participant who plays the role of a newly hired counselor. The task of the individual is to prioritize items and indicate how they would respond. A feedback interview is held to determine the rationale for responses on various items.

Leaderless Group Discussion. A Leaderless Group Discussion involving group discussion of a topic of vital interest to the group is held. Several topics are suggested that may be most appropriate in a rehabilitation facility for the blind e.g."to what degree should blind persons be independent and be expected to compete in jobs with sighted persons"? Such discussions will provide an opportunity both for assessment and treatment/ counseling realities.

Situation Exercises. These are a series of situations which might arise in counseling and social work. This allows the participant to demonstrate their ability to handle particular client situations. The participant plays the role of a worker in a welfare department. The task is to read the situation description (two or three sentences) which the participants answers by indicating: (1) immediate response, (2) on-going approach, (3) referrals made, (4) method of involving the client. This allows the participant to demonstrate ability to deal with very difficult ethical concrete problems encountered in the field.

MANAGEMENT

1.0 In-Basket. The participant plays the role of a new office manager for Fred's Financial Services, Inc. He or she is presented a series of memos and activities and asked to respond. The participant must response to absentee problems, interpersonal conflicts, and other work related problems by prioritizing items and developing written responses.

2.0 Analysis. The participant plays the role of an agency director in which information must be analyzed and recommendations developed.

3.0 Leaderless group discussion. A Leaderless Group Discussion involving group discussion of a topic of vital interest to the group is held.

4.0 Scheduling. The participant is involved in a simulation in which data is presented and scheduling decisions must be made. A written report is made which explains the assignments made and the rationale for making the assignments.

5.0 Interview simulation. The participant plays the role of a new supervisor of personnel for a motel. His or her task if to convince an employee to participate in a new job rotation program.

SALES

1. Orientation and Occupational Information
2. Case Simulations. The participants complete three case studies of actual sales situations for which participants must write a course of action.
3. Leaderless Group Discussion. Participants discuss a topic of concern and reach a consensus as on how to solve the problems involved.
4. In-Basket. The participant sells office equipment to various businesses across town.
5. Sales Interview. The participant simulates a sales interview to present equipment to the manager of a company opening a branch office across town.

Allied Health

1.0 Therapist simulation. A simulation of basic activities engaged in by physical and occupational therapist assistants. This includes applying head pads, giving massage, and teaching flexion exercises as well as teaching exercises which increase strength, reach and leisure time activities to a "patient recuperating from an accident".

2.0 Science Skills. This is actually a list of tests used to measure scientific aptitudes and achievements. You should use discretion when using this section. Consult a testing expert to determine which test is best suited for your client. While science skills are important, no one best test of these skills has emerged.

3.0 Measurement. This exercise provides the participant to use metric measurement. It is divided into two parts. The first part involves making calculations. The second part has the participant take actual measurements.

Dimension Rating

TOP-VIP uses an approach to scoring and rating drawn from assessment centers. Essentially critical "dimensions", or clusters of behaviors, have been identified for each career cluster. These have been defined and examples of positive and negative behaviors provided. For example, selected sales dimensions are provided below. Followed by an example of a "behavioral description" of a counseling/social work dimension.

SELECTED SALES DIMENSIONS

1.0 Sales Orientation and Presentation. Demonstrates interest, confidence, and enjoyment in contacting people to sell products or services; presents and/or demonstrates product or service enthusiastically and effectively;

handles and displays merchandise well; responds to objections in sales interview.

2.0 Interpersonal Skills. Establishes comfortable rapport with people; listens well; asks clarifying questions concerning problems and needs; shows sensitivity.

3.0 Achievement Orientation. Demonstrates motivation to achieve through high energy and activity level; is persistent in the face of rejection; works hard and longer hours than required if necessary; initiates tasks on own.

4.0 Customer Service Orientation. Communicates sincere interest in needs of customers; describes products and services accurately and honestly; makes realistic promises to customers.

Examples of Dimension and Behavioral Description

Dimension 1.0 Interactive Skills. Individual establishes comfortable rapport with people; listens attentively; and communicates a sense of caring and concern verbally and non-verbally.

Positive Behaviors

- Listens to individual talking.
- Makes statements that indicate understanding of the other persons.
- Maintains comfortable eye contact without staring.
- Asks questions or makes statements that encourage the individual to discuss their needs more.
- Shares personal perceptions and feelings related to other individual's concern or needs.
- Expresses concern non-verbally. For instance, by attentive body posture, caring feeling facial expressions and appropriate touching.

Negative Behaviors

- Poor eye contact
- Tense, rigid body posture
- Talking so much that the other individual has little chance to express themselves
- Constant "fidgety" movements
- "Closed" body position - e.g. arms tightly folded, and legs tightly crossed.
- Interrupts individual
- Expresses verbal or non-verbal disapproval and judgement of individuals
- Body position so relaxed as to communicate indifference
- Gives constant advice
- Statements indicate that the other individual has not been understood.

The procedure used for rating dimensions is described below:

1. Observe the performance or response of the individual on each exercise and describe them in behavioral terms. For written exercises, such as in-baskets or situation exercises, actual written records of the exercise may be used and summaries of written responses may be developed.

2. Responses and performances must be "coded" according to dimensions. This means that each behavior observed should be associated with a dimension that it represents.

3. Rate dimensions on the five point scale. Using observations (Step 1) and dimension coding (Step 2) assign qualitative ratings to each dimension for each exercise. This process will be used with each exercise. Behavioral descriptions are intended to provide "behavioral anchors" for the assignment of ratings on the scale. Additionally, the

Dimension Rating Guidelines Chart

Rating of	When
5 Very Good	Behaviors checked are mostly positive or Critical behaviors are strongly positive and negative behaviors are minimal.
4 Good	Positive behaviors predominate but some negative behaviors are present or Positive behaviors are weak in strength
3 Fair	Positive and negative behaviors are of about equal weight and Offsetting strong positive or negative behaviors do not occur
2 Poor	Negative behaviors predominate with some positive behaviors present or Negative behaviors are mild

1 Very Poor	Behaviors checked are mostly negative or Critical behaviors are strongly negative

4. Compare ratings to requirements for entrance into training programs. Ratings of the individual may then be compared to survey data that provides information regarding skill levels on dimensions important for success in training. Additionally, procedures are provided to conduct a "dimension analysis" of local training programs to assist in setting criteria. Additional, interpretive procedures are described in the TOP-VIP manual.

Conclusion

TOP-VIP is being introduced to provide materials for use with blind and visually impaired persons. It is hoped, however, that the model of assessment provided may provide evaluators with procedures to assist them in developing and expanding their programs.

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VOCATIONAL ASSESSMENT OF PEOPLE WITH SEVERE PHYSICAL DISABILITY

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Abstract

This article reviews vocational assessment for people with severe physical disability with the intent of better informing all vocational professionals about such activities and enhancing their knowledge. The article presents a detailed overview of the history of vocational evaluation for people with severe physical disability. Inefficiencies of standard evaluation models are reviewed. Elements of a model vocational assessment are extensively detailed. Steps in the selection of appropriate vocational evaluation laboratory equipment are described. The concept of testing and training within an assessment model is presented. The future direction of vocational assessment for people with severe physical disability is discussed. Issues are identified for further study.

The Rehabilitation Act of 1973 mandated services for severely disabled persons in the state-federal system (Rehabilitation Act of 1973, Federal Register, 1974). Researchers have reported that work evaluators consider severely physically impaired clients to be very difficult cases (Bates, 1981).

The purpose of this article is to examine the issue of work evaluation for the severely physically disabled population by reviewing the background of work evaluation, relating criticisms about standard work evaluation models, and outlining elements of a model work evaluation program. Particular emphasis is given to selecting appropriate testing instruments and implementing a testing/training concept within the assessment model. The article concludes with a discussion on future directions of work evaluation and the identification of issues for further study.

Background

Work Evaluation's development has been traced to the contribution of several disciplines over the past fifty years (Pruitt, 1977). Vocational assessment services for people with severe physical disability have lagged behind the application of vocational assessment services for people with other disabilities. Lawrence Bates (1981), in conjunction with the University of Wisconsin-Stout, Research and Training Center, conducted a survey of evaluation centers on the topic of evaluating severely physically impaired people. Bates reported: "In fact, approximately one third of the evaluation centers that responded indicated that they would like to be able to evaluate the vocational potential of severely physically impaired people but lack what they consider to be the necessary evaluation tools" (Bates, 1981, p.2).

In the review of literature, special techniques and studies presented new possibilities in this field. Micro-motor analysis systems have been developed to establish time standards for the completion of manual tasks. Two examples are Methods-Time-Measurement (M.T.M.) and Modular Arranged Pre-determined Time Standards (MODAPTS) (Bates, 1981). Shworles and Tamagna's study on development of modern vocational objectives for severely disabled homebound persons set forth techniques used to adapt modern vocational tools in assisting people to gain information industry skills (Shworles and Tamagna, 1973). The Controlled Environmental Laboratory Evaluation (CELE), developed by the Goodwill Rehabilitation Center of Milwaukee, presented an evaluation design which helps to control extraneous factors within the testing situation (Rosinsky, Luce, Nelson, and Currie, 1976).

Criticisms of Standard Work Evaluation Models

People have been critical of the vocational assessment services provided to the severely disabled population. Complaints have been made about the practice of using work evaluation techniques originally developed for the less handicapped and applying them with severely disabled people (Schalock & Koran, 1979). In addition, there has been dissatisfaction with the concept of screening out individuals because they fail to meet job readiness criteria of standard work evaluation models (Ditty & Reynolds, 1980). Recognizing their success in placing severely disabled people into community-based employment, researchers have been critical of work evaluation models that continue to describe these people as feasible for competitive employment (Revell, Wehman, & Arnold, 1984).

Elements of a Model Work Evaluation Program

Articles have been written on the criteria for an effective work evaluation service. The reader is referred to Sankovsky's work (1978) for a broader description. Turning attention back to this article, the author presents the following key elements of a work evaluation service for the severely physically disabled:

1. The Use of Modification. Regarding vocational assessment for the person with severe physical disability, the willingness to modify testing instruments and the knowledge to understand the implications of testing modifications represent key components in the process (Bates, 1981).
2. Effective Report-Writing Skills. Reports should provide a description of interventions for identified limitations, explain testing modifications, and analyze the validity and reliability of testing instruments utilized in the vocational assessment.
3. Awareness of Total Rehabilitation Process. Evaluators should be cognizant that a primary objective of vocational rehabilitation is job placement. Criteria for successful work evaluation programs should go beyond number of clients served and amount of income generated, and include number of clients placed into community-based employment. Work evaluators should extend the length of follow-up services to ascertain the impact of work evaluation on the total rehabilitation process.
4. Involvement in Professional Organizations. Work evaluation is a dynamic field. The number of available testing instruments has risen rapidly during the last ten years (Berven, 1984). Through involvement in professional organizations and attendance in continuing education programs, the evaluator keeps abreast of changes and provides an up-to-date service.
5. Location in a Comprehensive Rehabilitation Hospital. Work evaluation services are provided effectively in a variety of settings, however, there are distinct advantages in providing work evaluation services for the severely physically disabled in a setting where additional rehabilitation services can be obtained. The following services contributed to the comprehensive vocational evaluation package: Vocational counseling, Physical and Rehabilitation Medicine, Psychology, Neuropsychology, Physical Therapy, Occupational Therapy, Speech and Hearing.

Selection of Testing Instruments

A discussion on the merits and limitations of psychometric testing, work sample systems, and situational assessment techniques is outside the scope of this article. This section provides information about the use of psychometric tests and work samples for the severely physically disabled population.

Initially, testing instruments should be selected based on their ability to answer questions from the Individual Evaluation Plan (Botterbusch, 1978). Accepting the premise that a person should not be given a psychometric testing which requires greater reading ability than the person possesses, evaluators need to be knowledgeable of reading level requirements for each administered test (Botterbusch, 1978). Moreover, people with severe physical disability tend to perform poorly on tests designed to measure speed of response (Botterbusch, 1978). Tests should be administered in which a high percentage of people complete all items within the designated time limit. Turning to work samples, work evaluators should be prepared to make input modifications (Bates, 1981). Bates describes input as all the instructions which are given to the clients. Overall, the selection of testing instruments should be judged on performance in the areas of validity, reliability, and norms (Chandler, 1983).

Testing/Training Within an Assessment Model

Vocational assessment of people with severe physical disability represents a serious challenge to the evaluator. Creative solutions will continue to bridge the development of services. Testing and training within an assessment model typifies this approach. In this model, the evaluator assesses learning style and potential (Ditty & Reynolds, 1980). Moreover, the evaluator utilizes task analysis techniques to modify work samples and other testing instruments. The evaluator provides further modification to standard work sample procedure through repeated administration of the same work sample. This modification yields information about learning potential. In this model, the evaluator focuses on providing information about learning style and identifying information which might prove useful to a job trainer in a supported work role.

Future Directions of Work Evaluation

1. There will be earlier vocational rehabilitation intervention for people with severe physical disability (Coughran & Daniels, 1983). Programming within schools will be geared toward opening options for community-based work experiences.
2. Disabilities will continue to change (Spears, 1983). The evaluator will need to redefine disability and functional limiations based on advances in medicine and technology.
3. The physical boundaries of the assessment setting will extend out into the community. The use of video tape recorders to augment job analysis will become more prevalent.
4. There will be continued growth in the number of testing instruments available for work evaluation. The microcomputer will be a central part of the

evaluation process. With the expected increase in the number of available software packages, there will be more time demands placed upon the evaluator in selecting testing instruments.
5. Evaluators will strive to expand their referral base. Referral sources will include Private Instustry, Insurance Companies, and Self-Insured Companies. As a result, work evaluators will be held more accountable for their work and will be called upon as expert witnesses in legal cases.

Issues For Further Study

1. There needs to be research conducted on the topic of work evaluation effectiveness. Predictive validity outcome studies should be done to show the degree of relationship between work evaluation predictions and job placement outcomes.
2. There should be a study of work evaluation cost-effectiveness in serving the severely physically disabled population.

Summary

Vocational assessment of people with severe physical disability represents a significant challenge to today's work evaluator. The opportunity exists to analyze current programming and make the necessary changes within this dynamic profession.

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A BRIEF PREVOCATIONAL EVALUATION OF PSYCHIATRICALLY DISABLED INDIVIDUALS

CARRELL M. CHADWELL, Ph.D.

Abstract

At the Dallas Veterans Administration Medical Center, a brief prevocational evaluation battery has been developed to assess readiness to work of psychiatric patients and to identify potential problems in work functioning. The battery includes objective and projective measures of work- and self-attitudes, cognitive functioning, and general motor functioning. Most of the instruments are inexpensive and can be administered by paraprofessionals with a minimal amount of training. Attitudinal and self-presentation measures are obtained by a Vocational Questionnaire, Personal Capacities Questionnaire, and Forer Vocational Survey; the Cornell Medical Index Health Questionnaire and Pain Survey Schedule are also utilized when significant somatic complaints are involved. Cognitive functioning is assessed by the Henmon-Nelson Test of Mental Ability, Wide Range Achievement Test, Trail Making Test, Valpar Independent Problem Solving Work Sample, and card sort or hardware sort work sample; a brief verbal screening for memory deficits may be included. Motor functioning is assessed by the Minnesota Rate of Manipulation. The information yielded by the various instruments is discussed, as is integration of the data to draw conclusions about work readiness and possible deficits in work functioning.

Psychiatrically disabled individuals are widely recognized as a group for whom successful vocational rehabilitation is difficult (Green et al., 1968; McCue & Katz-Garris, 1982; Rubin & Roessler, 1978). Because of the high failure rate, selection of psychiatric clients for vocational rehabilitation is a critical issue.

Ratings of a person's work adjustment skills made in a work or workshop setting are generally regarded as best for evaluating general employability in terms of possessing the behaviors and characteristics required for successful work performance (Anthony & Jansen, 1984; Berven, 1980). Work samples are primarily useful in determining potential for particular occupations (Berven, 1980). Psychometric assessment is useful to screen cognitive abilities and academic skills that may be required in training and jobs; in addition, it has several advantages relative to other approaches to assessment (Berven, 1980; Neff, 1966). It provides relatively objective and reliable measures of performance. It is relatively quick and inexpensive. A large amount of varied data may be collected in a brief period of time. Assessment data thus collected may be sufficient to facilitate decisions regarding vocational goals, training and job placement. In other cases, the data may identify further specific evaluation needs. Thus, use of psychometric assessment early in the evaluation process can help focus subsequent efforts and can be cost-effective in terms of time and direct expense.

At the Dallas Veterans Administration Medical Center, a prevocational evaluation battery has been developed to assess readiness to work of psychiatric patients and to identify potential problems in work functioning. The battery was designed to obtain maximum information about work readiness with minimal expenditures of staff time and testing materials and equipment. It can be individually administered and scored in 2 1/2 to 3 hours by a technician with minimal training; at the Dallas Veterans Administration Medical Center, this is usually done by lay volunteers trained for that function. Since some of the tests do not require constant supervision or individual administration, it is possible to shorten the per-patient administration time by working with two patients simultaneously during part of the evaluation.

A combination of tests and brief work samples were selected to assess cognitive functioning, motor functioning, and attitudes regarding work-related issues, including self-presentation. Most of the instruments are inexpensive and require very little space for storage and administration.

Measures of Attitudes

The basic instruments used to assess attitudinal and self-presentation factors include a Vocational Questionnaire, the Personal Capacities Questionnaire, and the Forer Vocational Survey.

The Vocational Questionnaire is a locally developed form which solicits information regarding work skills, vocational interests and goals, vocational limitations, past problems on jobs, training and education, military history, expectations about work, work history, and miscellaneous other factors. This form yields information about the client's goals and expectations, perception of his limitations and problem areas, and stability and level of functioning of work and lifestyle. The client is asked to write a paragraph indicating whether he feels able to work, why or why not, and what needs to happen to enable him to work. In addition to direct data, handwritten responses on the Questionnaire are evaluated in terms of neatness, literacy, presence of thought disorder or organicity, carefulness, idiosyncrasies, compliance, etc.

The Personal Capacities Questionnaire is part of the Functional Assessment System (Crewe and Athelstan, 1984). It consists of 40 items on which the client rates himself in terms of sensory, motor, psychological, intellectual, social, biographical, and environmental capacities. The form can be used to identify client-reported limitations which may require exploration, and to assess whether the client's general self-presentation is realistic and insightful, positive or negative.

Very positive self-evaluations cannot be assumed to reflect actual functioning or even actual self-concept but rather should be interpreted as how the client overtly presents himself. Hypotheses may be drawn, of course, about the extent to which self-ratings accurately reflect capacities and/or self-image, and these hypotheses can be tested against other data gathered in the evaluation. Very negative or mildly but pervasively negative self-evaluations bode ill for rehabilitation success, since the client either actually is significantly impaired or has a generally negative mental set which is likely to impede rehabilitation.

The Forer Vocational Survey (Forer, 1957) is a projective measure of work-related attitudes in the form of a sentence completion test. It examines three areas of occupational activities: attitudes, feelings and responses to specified situations involving authority figures, co-workers, criticism, failure, taking orders, and responsibility; the client's belief about causes of his own aggression, anxiety, failure, and job change; and vocational goals.

As with the Personal Capacities Questionnaire, the responses are not interpreted as accurate representations of attitude and behavior but rather as the client's self-presentation. Responses indicating positive attitudes and appropriate work behaviors at least demonstrate that the client is aware of appropriate attitudes and responses; whether he actually exhibits them in a work setting must be interpreted by integrating them with other assessment data. Negative or inappropriate responses may identify problem areas. The evaluator looks for patterns, inconsistencies, and idiosyncratic responses, and trite or bland responses are given little weight. As with the Vocational Questionnaire, the free-style handwritten responses can be evaluated for literacy, expansiveness, compulsivity, evidence of thought disorder, etc.

When the client complains of significant somatic symptoms, two additional tests may be employed to assess psychological involvement in the somatic symptomatology: Cautella's Pain Survey Schedule, and the Cornell Medical Index.

The Pain Survey Schedule (Cautella, 1981) solicits the client's perception of his pain and its effects in the form of a questionnaire. The client is asked to describe his pain, rate its intensity and characteristics, identify antecedents and exacerbating circumstances, describe consequences including reactions of significant others, etc. Responses are interpreted in terms of consistency of description with actual physical conditions, exaggeration, pervasiveness, morbid preoccupation, autonomic indicators of emotional distress, reinforcers, and so forth. For example, a person with a strong psychological component to his symptoms may endorse items describing his pain as dull, sharp, throbbing, steady, shooting, tingling, pricking, deep, crushing, and numb; rate its intensity at 80-100% in almost all situations suggested; indicate that it becomes worse when he wakes up, from breakfast to lunch, from lunch to supper, and while trying to sleep at night; indicate that his pain is often accompanied by nausea, dizziness, rapid breathing, and sweating; and rate that he thinks of pain more than 40 times a day.

The Cornell Medical Index Health Questionnaire (Brodman et al., 1949) consists of 195 questions about symptoms related to various body systems such as respiratory, cardiovascular, and orthopedic, and mood and feeling patterns such as depression or anxiety. In addition to identifying possible medical problems needing exploration, the test may reflect psychological involvement in symptomatology by means of a very large number of endorsements or diffuseness of self-rated symptoms across multiple body systems. Brodman et al. (1954) found that for 900 Army inductees, the number of "yes" responses on the CMI made at pre-induction examination predicted the probability of developing inadequacies in their military careers in terms of number of sick calls, days hospitalized, days AWOL, convictions by courts-martial, and discharges from service.

Measures of Cognitive Functioning

Cognitive functioning is assessed by the Henmon-Nelson Test of Mental Abilities, Wide Range Achievement Test, Trail Making Test, Valpar Independent Problem Solving Work Sample, and card sort or hardware sort work sample.

The Henmon-Nelson Tests of Mental Ability, 1973 Revision, are paper and pencil, group-administered tests of general mental

ability normed on students from kindergarden through 12th grade. Types of items sample a variety of cognitive abilities including word knowledge, verbal analogies, verbal classification, sentence completion, numerical problem solving, number series, pictorial analogies, and pictorial classification (Lamke and Nelson, 1973). WAIS (Wechsler Adult Intelligence Scale) IQ equivalencies are provided for scores. The manual reports split-half reliability coefficients for grades 3-12 ranging from .933 to .965. Congruent validity is reported in the manual by correlation with other tests of mental ability ranging from the low .60's to the low .80's, with most of the correlations in the mid- to high- .70's. The Henmon-Nelson provides a good brief (30-minute), easily administered and scored assessment of general intellectual functioning.

The Wide Range Achievement Test (WRAT) measures basic academic skills of reading word recognition and pronunciation, written spelling, and arithmetic computation (Jastak & Jastak, 1978). The manual reports reliability coefficients, based on 20 years of testing of numerous populations, ranging from .92 to .98 for the reading and spelling tests and from .85 to .92 for the arithmetic test. The content validity of the reading scores was tested against teacher's ratings of 29 5th grade students and yielded a correlation of .78. Correlation with grades was .88 for the reading test for the 5th grade students, and .560 to .641 for the arithmetic test for 5th and 6th grade students.

The WRAT is used in the prevocational evaluation to assess ability to participate in training or jobs requiring such basic academic skills, and the need of remedial education. Poor scores on the arithmetic test may reflect poor concentration rather than lack of skills; this hypothesis should be checked against other data.

The Trail Making Test (TMT) is a brief paper and pencil test which is part of the Halstead-Reitan Neuropsychological Battery (Reitan, 1979). Part A requires basic motor and spatial skills, while Part B requires, in addition, the ability to remember and follow a complex plan (alternating numbers and letters) and to be cognitively flexible (Golden, 1979). According to Golden, if performance on both parts is impaired but B is better (B is less than twice A), the deficit is in spatial or motor functioning; while if A is better (B is greater than three times A), the deficit is in handling verbal material, planning, or flexibility. The test may be used to identify impaired attention and inefficiency in sequential thought processing, particularly involving the ability to shift sets from one process to another; very poor performance on the Trail Making Test may predict general difficulty in following detailed new procedures and adapting to changes in expectations (Heaton & Pendleton, 1981).

Heaton et al. (1978), evaluating a number of neuropsychological and personality tests as predictors of employment, found significant differences in TMT performance between employed and nonemployed patients; they found that the most reliable differences between the employed and unemployed groups occurred on such tests of current adaptive ability rather than on tests more related to past experience and level of education (e.g., fluid rather than crystalized intelligence). Golden (1978) examined the usefulness of the TMT with acute schizophrenics and found that, when problems of motivation and bizarre behavior were eliminated, the test had an overall accuracy of 80% In addition to cognitive functioning, the TMT reflects basic fine motor skill.

The Valpar Independent Problem Solving Work Sample (IPSWS) requires comparison of colored forms on test cards to one of three master keys to identify and record discrepancies. It is similar to a quality-control task and appears to involve color, form and spatial perception, eye-hand coordination, finger and manual dexterity, ability to grasp and follow instructions, attention to detail, and ability to shift sets and make rapid judgments.

The manual (Valpar, 1976) gives a reliability coefficient for a sample of 50 employed workers of .88 for completion times, .79 for errors, and .82 for overall performance. The IPSWS is assumed to have content validity in terms of its correspondence with worker traits identified in the Dictionary of Occupational Titles (U.S. Department of Labor, 1977).

Saxon et al. (1983) administered the General Aptitude Test Battery (GATB) and selected Valpar work samples to 259 vocational rehabilitation clients and found significant correlations between the IPSWS and the GATB subtests of Intelligence (.56), Numerical Aptitude (.50), Form Perception (.60) and Clerical Perception (.57). They suggest the IPSWS may measure general areas of behavior related to those aptitudes. Barry (1982) found that, for a sample of 33 chronically mentally ill subjects, competitively employed subjects could be discriminated from those who were unemployed with 81% accuracy by means of combining three scores in a discriminant function: completion time of the Valpar IPSWS, completion time of TMT (A), and the Wide Range Interest Opinion Test (WRIOT) Negative Response Bias scale.

Two work samples were developed locally and normed on psychiatric patients referred for vocational evaluation at the Dallas Veterans Administration Medical Center. The card sort consists of 61 9"x5" simulated hospital admission record cards, each printed with a person's name, address, county code, Social Security number, hospital date, admission, and ward. The patient is asked what kind of filing system would be most efficient for retrieving a given card; his response is noted, and he is then asked to set up the cards in an alphabetic system. Using a structured rating form, his behavior during this task is observed and rated on a number of dimensions including ability to conceptualize the problem, to organize work, to concentrate, to maintain motivation, to believe in or rely on himself, to make decisions, to control frustration level, to maintain an even temperament, to accept supervision, to deal with ambiguity, to use good judgment, and to pay attention to detail.

The work sample is considered to be an ambiguous task to which the patient must apply

his own structure; it is especially useful for evaluating problem-solving, organization, and perseverence in a tedious (to some patients frustrating) task over a period of generally 15-25 minutes. Time and errors are also recorded and compared to local norms, as measures of speed and accuracy.

A hardware sort work sample has been devised and is in the process of being locally normed for use with patients with low literacy skills. This consists of a bowl of various- sized screws, nails & washers, which are to be sorted by type and size into drawers of a tool box in whatever manner the patient considers most efficient for locating a given item. His solution, his approach to that solution, his general behavior, speed and accuracy are evaluated in the same manner as with the card sort work sample.

When there is reason to believe memory may be impaired, a brief verbal screening can be done to determine the need for more in-depth assessment. Short term memory can be assessed by asking the patient to repeat a sentence (e.g., "The fat short boy dropped the china vase") and by asking the patient to listen to and then follow a series of directions (e.g., "When I tell you to start, I want you to use your RIGHT HAND to touch first your NOSE, and then your LEFT EAR. Then, with your LEFT HAND, touch the TOP OF YOUR HEAD. Go ahead.") Intermediate memory can be tested by telling the patient to repeat three unrelated words (e.g., BROCCOLI, DICTIONARY, TOYOTA) until he has them memorized; after a distracting intervening task such as serial 7's, the patient is asked to recall the words. Long term memory can be assessed by asking questions such as to name four U.S. Presidents since 1900, or to name the last war in which the U.S. was directly involved.

Measures of Motor Functioning

The Minnesota Rate of Manipulation Test (MRMT) measures the speed of gross hand and arm movements as used in many semi-skilled factory and industrial operations and certain clerical operations (American Guidance Service, 1969). It is a very popular method of assessing manual dexterity. Test-retest reliability coefficients ranged from .87 to .95 (Jurgensen, 1943), and split-half reliability ranged from .84 to .94 (Tuckman, 1944). Validity correlations ranged from .39 to .67 in comparing MRMT scores to success in tasks requiring manual dexterity (Jurgensen, 1943).

Gill & Trujillo (1985) studied the appropriateness of the MRMT with a psychiatric population and found performance of patients with a wide variety of psychiatric diagnoses was highly reliable based on repeated trials of subtests. Results showed no difference in scores with respect to patients' age, psychiatric diagnoses, medication or length of work experience.

Subjective assessment of eye-hand coordination and finger and manual dexterity may be made through observation of performance on the Valpar IPSWS and the card sort work sample and by examining the pattern of errors on the IPSWS for a possible tendency to hit the wrong hole. Fine motor skill may be subjectively evaluated through performance on the TMT.

Integration and Interpretation of Data

Attitudes toward work and toward self are critical in their effect on work performance and job maintenance. Very negative attitudes almost guarantee failure in terms of a self-fulfilling prophecy. Positive attitudes may strengthen motivation and persistence. Knowledge of appropriate attitudes facilitates interpersonal functioning.

In addition to the instruments described above which specifically assess attitudinal factors, data can be drawn from the client's behavior during the testing process regarding motivation, persistence, conscientiousness, self-confidence, resistance to following orders, etc. In integrating the data, the evaluation should look for patterns, consistencies, and inconsistencies. Expressed attitudes should be compared with indirect or performance data to determine their validity and to uncover covert attitudes. Self-presentation, even when inaccurate by evidence of other data, should be noted since this may determine the initial image received by the interviewing employer or supervisor. False professment of appropriate attitudes at least indicates the client is aware of what is appropriate, thus has some social skills! Conclusions should be drawn about the client's general attitude toward work and toward himself as a worker, including motivation, how the client presents himself to others, his probably typical behavior in a work situation, and specific areas of work functioning in which problems are likely.

Cognitive functioning is often an area of concern with psychiatric patients, either because of chronic thought disorder uncorrected by medications, or because of side effects of the medications themselves. In addition to general level of intellectual functioning and academic skills, data should be examined to assess concentration and ability to process information, ability to handle complex data, ability to learn and follow instructions, amount of structure and supervision needed, flexibility and adaptability, and problem-solving ability. Deficit areas should be identified and conclusions drawn about their probable effect on work performance in terms of limitations.

In assessing work readiness of psychiatric patients, measurement of motor functioning is important primarily because of the psychomotor retardation or tremors often caused as side effects of psychotropic medicines. The evaluator is concerned with determining whether such side effects are present to a degree which will significantly impair work performance or impose limitations on job placement.

Data regarding attitudes, cognitive and physical functioning may be summarized both descriptively of the client and in terms of areas of impairment. Predictions can then be made about overall work readiness and probable areas of difficulty, and recommendations can be made about appropriate types of training or job placement or about further evaluation needed.

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VOCATIONAL ASSESSMENT: A TOOL TEXAS IS PUTTING TO USE IN OFFENDER (RE)HABILITATION

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Abstract

The Texas Department of Corrections has been mandated to serve the mentally retarded offender as a result of a court decision rendered in 1980. The Mentally Retarded Offender Program (MROP) was developed as a result with a comprehensive plan encompassing all levels of rehabilitative services including vocational assessment, the main theme of this presentation. Some background material leading to the development of the MROP in general will be presented with specific attention being devoted to the Vocational Assessment section. Both males and females are profiled. At any one time there are one thousand MROP offenders identified and placed at either of the two designated units within TDC. Only vocational evaluations are in effect now but future plans call for work adjustment training, OJT at the prison, placement (within and outside the prison), and developing a viable commercial industry within the prison.

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Vocational assessment has grown up in rehabilitation centers and has expanded beyond that realm to new frontiers. Schools, corporations, and institutions have all accepted the challenge. Some have done so realizing vocational assessment as a viable tool in working with handicapped people to discover their strengths, abilities, and potentials. Others have begun to use this technique only because federal laws [Rehabilitation Act of 1973, Sec. 504; Vocational Education Act of 1963; Education for All Handicapped Children Act of 1975, Sec. 613, (A)(2)] have mandated or strongly suggested the use of vocational assessment through inference. In certain instances court cases have brought this about, specifically, Ruiz v. Estelle (1980).

The Texas Department of Corrections (TDC) has been involved in litigation since 1972 when David Ruiz (1980), at that time a TDC inmate, brought action alleging "...that certain operations of the Texas Department of Corrections were unconstitutional..." (p. 1267). Among the findings the Chief Judge held "...that health care was inadequate..." This began a chain of events which lead to the development of the Mentally Retarded Offender Program (MROP) of which one integral part is the Vocational Assessment section.

The purpose of this presentation, therefore, is to acquaint the reader with a brief historical sketch of the suit with TDC and the creation of the MROP; what is currently transpiring in the Vocational Assessment section of the MROP; and some hint as to what may take place in the future within this section.

Background Information

Attention is directed to the court case which reads: "The TDC failed to meets its constitutional obligation to provide minimally adequate conditions of incarceration for the mentally retarded..."(Ruiz, 1980). Amendments VIII and XIV of the U. S. Constitution were cited. For unspecified reasons the Chief Judge chose to place the disposition of the mentally retarded offender under the broad umbrella of health care and, specifically, under psychiatric services. It should be noted that in the original suit and in subsequent consolidation with seven other suits to form a class action suit, the question of the mentally retarded offender did not immediately surface. Only when investigations began did the plight of this particular population become apparent.

As with the case of the mentally retarded person in society, until recently, the prison system in Texas did little or nothing to serve this segment of its population. According to the Windham School District (WSD), an independent school system within TDC, it estimated that ten to fifteen percent of the TDC population would be classifiable as mentally retarded. This percentage differs much from the free world percentage probably because TDC uses a WAIS-R score of ≤73 as a cut-off point, along with adaptive

behavior scales, rather than the ≥69 score which is generally advocated to label an individual as mentally retarded. This 1978 estimate of WSD for the court would have suggested a total MR population in TDC at between 2600 and 3900. Today with the criteria the same the percentage has been lowered to approximately two to three percent of the total prison population. It is undeniable that the population is present within the system and ought to be evaluated and treated.

Previous attempts. While TDC has not been the first state to recognize the need of the MR offender, it is generally considered to be the first to approach the problem in such a radical fashion, i.e., identification of and placement under one roof of all MR offender for provision of special services. The South Carolina prison system (one of ten nationwide) has worked with the MR offender since 1972 under a Law Enforcement Assistance Administration (LEAA) grant. This prison system worked with offenders on a very limited basis, a thirty-five client capacity. Deemer and Conine (1984) outlined the ten step program initiated by South Carolina. The program included work evaluation and adult work activity programs. Idelberger (1973) wrote that "the mentally retarded do share some special needs and problems that require special consideration..." (p. 163). In the early 1970s the State of Flordia Vocational Rehabilitation Agency was permitted to expand its service area into the Department of Corrections.The program was successful but had to be terminated when the 'behavioral disorder' category was no longer listed as a handicap under the Rehabilitation Act amendments of 1974.

Since the issue of the MR offender was addressed in the courts a plan was ordered to be written covering services for this special needs population. A plan calling for full services was proposed and accepted in time by the courts. Besides basic health and educational services the plan proposed a case manager (coordinator of services) concept, a full complement of psychological services and a vocational component. Chief Justice Burger (1971) and Nelson (1985) both have argued convincingly that offenders should have marketable skills to attract the attention of prospective employers and to assist the offender in becoming a productive citizen. The President's Task Force on Prisoner Rehabilitation (1970) posited that a constructive member of any community is a satisfied working member. The heart of the correctional process ought to aim for satisfying work experience within the institution, vocational training provided as needed, and assurance of decent jobs for released offenders. Almost 90,000 prisoners are released each year on parole (Uniform Parole Reports, 1979) and most emerge from incarceration with no job skills, little or no work experience to rely upon, no job stamina, and no work ethic.

Summation. Thus, the vocational aspect is considered a most valuable service for the MR offender. Historically this individual finds it difficult to locate a position in the world of work which especially is rewarding economically. Reasons for this, besides being an ex-felon, are many. They include the person's inability to communicate effectively, the inability to understand his (her) true potential, abilities and/or skills, the inability to make career decisions. The MR client was and is at a distincet disadvantage. An individual who can obtain a job and is satisfied with it will in all probability not resort to crime when income is sufficient to meet basic needs. Therefore, the MR client is considered a prime candidate for as much vocational help as reasonably possible. It was considered cost effective to house all MR offenders within one unit.

Current Situation

The Vocational Assessment section of the MROP is housed at Beto I Unit (near Palestine, TX) which is designated to serve all male MR clients in TDC. An outreach program providing identical services, as decreed by the court, to the female MR offender incarcerated at Gatesville Unit, Valley section is now operational from the Beto I unit.

While the Vocational Assessment section is responsible for all MR clients both male and female for vocational testing and related services, the current concern is centered around those clients who are newly received at Beto I having been previously diagnosed as mentally retarded at the Diagnostic center (Goree Unit). Each individual received into TDC is given a series of tests including the Revised Beta II, the WAIS-R, and an adaptive behavior scale. Criteria have been established for designation of persons as mentally retarded. Any person scoring below the pre-established criteria are considered for the MROP unit. It is not the purpose of this paper to discuss whether these individuals so identified and labeled as mentally retarded are indeed so or whether they might better be classified as disadvantaged, learning disabled, developmentally disabled, and so on. This is the subject for future research.

Over time every MR client received both at Beto I and Gatesville will be thoroughly assessed vocationally among other disciplines. Each client will, as results of the vocational process are finalized, be recommended and, it is hoped, placed in appropriate education, training, and/or work situations during the remainder of his (her) sentence. Since current staff and equipment are not up to expectations newcomers to the program will be given first option at receiving services. The current population, 928 as of February 26, 1986 (Beto I), indicated such a move. For practical purposes it was decided to focus on this segment of the MR population. As the need arises other MR client will be assessed. At the current pace in releases and arrivals, all MR clients will have been evaluated by July, 1986.

The female MR population is currently thirty-five as of February 7, 1986. The Gatesville Unit is visited once per month. The entire population ought to be evaluated by May, 1986.

Each week approximately twenty to twenty-five clients are received at Beto I. Only one or two per month are received at Gatesville. Clients are interviewed during their first day on the unit by the vocational staff. The interview concentrates on demographic data (to aid in research) and information pertinent to the vocational (work) aspect, i.e., educational and vocational training levels, medical history, previous work experience. While all information at this point is self-report by the client, every attempt is made to verify the information. Each newly received client is placed on the Diagnostic and Evaluation (D & E) wing for thirty days to be easily available for all types of evaluations, in

this case, for vocational assessment.

Techniques in use. The techniques used in the vocational assessment section are extremely limited at this time due to lack of operating budget. Instruments which are available include the Career Decision-Making System, AAMD Becker Reading-Free Interest Inventory, Wide Range Achievement (WRAT), Minnesota Spatial Relations Test, Minnesota Rate of Manipulation Tests, Bennett Hand-Tool Dexterity Test, Crawford Small Parts Dexterity Test, Wells Concrete Directions Test. Pennsylvania Bi-Manual Work Sample, Purdue Pegboard, Revised Beta II, Basic Skills Test. Each of the above has been used in the evaluation process at Beto I. The McCarron-Dial Work Evaluation System has been ordered and portions have arrived. An individual trained in the administration of the MDWES has been hired. This system and those previously named are being used in part because that is all which could be obtained and in partbecause they have been used on MR populations (Dial, McCarron, Freemon, Swearingen,1979). This is certainly not an ideal situation, not even as adequate one. However, what is available must be used and is to the greatest possible efficiency and with effectiveness by the vocational specialists on staff.

Demographic Details. For the purpose of this presentation ninety-nine files were randomly selected from the male MR population of those evaluated. All thirteen files of Mr females evaluated were canvassed. As mentioned above certain demographic material had been collected and is on a regular basis. It is shown here for general interest. In later articles of a research nature the data will be used for inferential purposes.

In a demographic report on the male MR population prepared for internal purposes in April, 1985. the following items were noted as significant:

average age	27
racial make-up	
Black	78%
White	9%
Hispanic	13%

In 1980 the ethnic breakdown submitted to the court indicated that there were in the general population in TDC forty-three percent Black, thirty-nine percent White, and nineteen percent Hispanic. Other data submitted showed the mean age to be 29.5 with forty-one percent of the population twenty-five years old or younger. The report to the court further revealed that sixty-one percent were first time offenders. The court document also indicated the mean IQ for the entire TDC population was 93.9. In addition, it noted that thirty percent had severe alcohol problems and individuals with chronic drug abuse problems was also at this percentage.

By comparison the MROP population both male and female as obtained from the files mentioned above have the following characteristics.

Males. The MROP male population has been observed to be predominantly Black who is in the arbitrary age grouping 21 - 25. He would be a recidivist with a forty percent chance of being either and alcoholic and/or a drug abuser. He would more than likely be convicted of a burglary or assault. His chances of being from an urban area over a rural area would be twice as great. Dallas and Houston metropolitan areas are most often recorded. He would have held three jobs. The tenth grade in school would have been the maximum. There would be a one in three chance of his being enrolled in special education and a one in five chance of being placed in vocational training. The average Verbal IQ would be 67.3; the Performance IQ, 70.1; the Full Scale IQ, 67.5. (Please refer to Table 1 for selected demographic data).

Table 1.

Selected Demographic Data - MROP

Group	Male (N = 98)		Female[a] (N = 13)	
Race:				
Black	71	72.4%	10	76.9%
White	7	7.1%	2	15.3%
Hispanic	20	20.4%	1	7.6%
Age:				
17 - 20	12	12.2%	1	7.6%
21 - 25	26	26.5%	5	38.5%
26 - 30	17	17.3%	4	30.8%
31 - 35	24	24.4%	2	15.2%
36 - 40	7	7.1%		
41 - 50	7	7.1%		
51+	1	5.1%	1	7.6%
	Range = 17-65		= 20-51	
	Mean = 30.6		= 28.2	
	Mode = 21		= 24	
	Median= 29		= 26	
Grade:				
no school	4	4.1%		
1 - 5	15	15.3%	1	8.3%
6 - 8	19	19.4%	7	58.3%
9 - 12	60	61.2%	4	33.3%
	Mean = 8.1		= 7.9	
	Mode = 10		= 8	
	Median= 9		= 8	

[a]Female N in grade group = 12.

Females. The MROP female population is also predominantly Black and would be in the same age bracket on the average as the males but she would only be a first time offender. Her reason for coming to prison would be probation violation. She would not be an alcoholic but would have a ten percent higher chance of being a drug abuser. Her family constellation would be situated in a metropolitan area as the males. She would have held two or perhaps three jobs for two years. (Please refer to Table 1 for selected demographic data). More complete demographic data can be reviewed in Appendix A.

These are the clients who are currently in the MROP. They are requested to participate in vocational assessment. Approximately five percent of the males have chosen for a variety of reasons not to do so with several changing their mind at a later date. No female refused initially to participate although one female refused to continue in the process once she was halfway through.

Clients are generally seen in the afternoon so as not to conflict with the WSD school operations in the morning. This vying for space will be non-existent once the new educational building is completed (June, 1986) since appropriate space has been allocated to the vocational assessment section.

Selected results. Clients are presented with both paper/pencil tests and hands-on techniques as outlined above. It has been observed that both male and female clients generarlly do better in performance areas, i.e., BHT, Crawford, MSRT, and so on than they do on achievement tests, specifically, the WRAT.

On the WRAT (see Table 2) males achieved better results over all than females in reading and spelling while females achieved higher level scores on the average in arithmetic.

Table 2.

Selected Test Results - MROP

Instrument	Male (N = 98)	Female (N = 12)
WRAT:		
Reading	2.6 G. L.	1.9 G. L.
Spelling	2.9 G. L.	2.5 G. L.
Arithmetic	3.1 G. L.	3.3 G. L.
BHT:		
1st Trial[a]	8' 07"	13' 41"
2nd Trial[b]	7' 21"	9' 58"
3rd Trial[c]	6' 46"	
Crawford:		
Pins/Collars	8' 42"	7' 20"
Screws[d]	11' 54"	12' 16"

[a]Female N = 13. [b]Female N = 8. [c]Male N = 94. [d]Male N = 97.

On the BHT males performed better on the average across three administrations but not as much as did the females across two administrations (see Table 2). Females appeared to have more trouble handling the heavy tools than in following the intricate instructions. While the BHT is to be administered once in its entirety, multiple administrations were decided upon to obtain data and observations regarding a possible practice effect or learning curve for this particular population. As can be seen in Table 2, there are improvements on the results of each trial on the average. The greater majority of those tested on this instrument improved on each trial. Besides the improvement noted in time another observation was seen by the specialist, i.e., the evaluee exhibited a 'thrill' when he/she performed quicker in subsequent administrations. This 'thrill' was exhibited both verbally and non-verbally.

The Crawford (see Table 2) results indicated that females on the whole tend to be better performers than males on the pins and collars segment but not so on the screws portion of the test. Males appeared to have more difficulty in handling the small tools required for this test and also in the picking up of the small materials either with their fingers (screws) or pins and collars (with tools).

The Wells Concrete Directions Test offered valuable observations for both groups. While the males scored approximately one point higher than the females, 39.1 and 37.9 respectively, it does not appear significant. It is possible that differences between the two groups could be decreased if some of the 'man' items as the female clients called them were replaced with 'female' items. For example, the hammer, wrench, and pliers might be substituted with a rolling pin, a potato peeler, and a scissors. Kessick (1973) saw a definite need for measurement of ability to follow directions as do the vocational specialists.

The Career Decision-Making System instrument has been the interest test used most often though it has to be read to the clients since their reading level is too low. The survey is preferred over the reading-free AAMD Becker because the categories of the CDM are readily associated with the ones in the Guide to Occupational Exploration (1979) and to the Dictionary of Occupatioal Titles (1977, 4th edition). Results indicated with this group that males preferred the crafts category which can be associated with either the mechanical (05) or the industrial (06) areas of the GOE. Since a second choice is always noted their preference was the social area (humanitarian (10). The least assigned category to their responses were clerical, business, and technical (one point for each) and the arts which received no scoring. The males seemed to be more discriminating in their responses and decisive in their choices. On the other hand the females were much less discriminating. As a result there was more clustering areas liked or preferred. Their first choice (preference) was social while crafts came in second by not much difference existed between the two.The only area receiving no scoring points was the technical area/ They appeared to like and want to do almost anything.

Before concluding this section on test results more comments are needed in reference to the WRAT. Attention is directed once more to Table 2. Without appropriate anaylsis there is no reason to ponder whether differences between groups and/or subtests within the WRAT are significant.What is absolutely clear is the fact that these evaluees are at a very low level in the basic achievement areas. Most have never been able to read a newspaper. Many are unable to write letters home. Case managers are responsible for this service. Still, many are unable to write their own name. Instead a thumbprint is taken each time documentation of a name is needed for official purposes. Moore, Gartin, and Carmack (1981) argue for the use of the WRAT despite a review by Buros (1949) which was skeptical of its reliability and validity. With proper use this instrument can be very helpful.

Clients characteristics. For the most part clients have been found to be extremely cooperative when attending evaluation sessions. They respond very much to praise which is genuine and work harder upon receiving this type of reward. They appeared interested in what type of work they can do and might be able to do. Hoever, there is a tendency with the males especially to set sights on jobs or careers which are obviously beyond their potential. They are also more concerned about salary when thinking of work. This has more to do with self-esteem than making enough on which to live. Many

be willing to learn more about themselves and to establish appropriate work behaviors. With this willingness the Vocational Assessment section can begin to make some headway.

A Look Forward

Besides the very basic evaluation which currently is in place more services are being considered. In time a full complement of evaluation equipment will be assembled. While the 'usual' systems are being considered, actual work samples and on the job evaluation techniques as outlined by the VEWWA Special Project (1975) and McCray (1982) are being written into the sections's plan.

It is also quite evident that the scheduled number of vocational specialists, four, is quite inadequate to serve the population in question. It would be appropriate to request some aides also.

A work adjustment training component is being developed and is partially in place. As a result of a client's vocational assessment process, work areas are being recommended and the client is sometimes being placed in the recommended areas which would be consistent with his abilities, skills, potential, and possibly, interests. Behavioral observations will be a key element in this process. Several forms already on the market are being reviewed. These will be used to assess worker characteristics as noted chiefly by the work supervisor. Case managers will also be helpful in this regard. However, some in-service training will be necessary for both of these groups so they may be able to make proper observations. It is well known that most people do not lose their job because they cannot do the work. But rather they are fired or quit in frustration because they are unable to communicate effectively, get along with fellow co-workers, and all those other worker characteristics listed at the bottom of the VALPAR work sample recod sheet. Once the observations are obtained individuals with below performance criteria ratings will be referred to work adjustment training in lieu of being transferred to another job or being given a disciplinary case. As much as possible the time devoted to work within the prison compound ought to reflect the procedures carried on in the work force outside the prison.

Training is another important aspect to be addressed. The WSD already has three training programs in operation: plumbing, CVAE building trades and horticulture. Three others are being added: building maintenance, masonry, and small engine repair. The Vocational Assessment section is called upon to ascertain which MR clients would be most realistically identified as candidates for these training programs. These programs are a composite of book learning and actual on-the-job training. Each program is and will be geared to the level of the population.

Another possibility for the future although a dimmer prospect is the creation of a full scale industry, e.g., specifically for the MROP clients. Many rehabilitation centers use industry as the main source of income although sub-contracting is used most often. This concept, especially in relation to an industry like horticulture, is ripe for development. People today have much more leisure time than years ago (Naisbitt, 1982). Some of the extra time is being spent in planting home gardens and in cultivating flowers, exotic plants or common ordinary houseplants. An industry directed toward horticulture could provide commercial outlets with an appropriate number of bedding plants, starter houseplants, and seeds. The possibility is present that the MR client could earn income to be used toward their daily sustenance while in prison, to provide needed income for dependents currently relying on federal and state aid, to provide restitution to victims of the offender's crimes. A program of this type can be worthwhile and may come to fruition. However, it would not be without critics. An inherent problem with this concept may stem from laws already on the books. Congress passed the Hawes-Cooper Act (1929) and the Ashurst-Sommers Act (1935) which restricted the sale and interstate transportation of prison-made goods. Vito (1985) has presented some new look at this situation and the Texas State Legislature has recently passed a law in the 1985 Biennium session which would permit prison industries to work with commercial concerns.

A concept which looks to the past in the future is program evaluation. No program would be complete without it. The Vocational Assessment section is certainly going to be ready to be evaluated to determine whether the services the client is receiving are effective and efficient. In order to do this a follow-up system will have to be established. It has not been done in the past but this does not mean that it can't be accomplished.

Conclusion

The entire process of vocational assessment and its related services is promoted because of the desireable outcomes it engenders, i.e., placement in competitive employment.

Couch and Cosgrove (1977) offered encouragement after their review of current literature of that time despite the "nothing works" attitude spread by articles by Lipton, Martison, and Wilks (1975) and Martison (1977). There is evidence of rehabilitation potential in offenders (Idelberger, 1973). The vocational assessment process can be a key element in helping toward increasing this potential.

The public offender, in particular the mentally retarded one, has been bombarded with conscious and subconscious expectations from all avenues. They react to these daily cues at the time and later on. A more positive and more humanitarian approach is needed. The Texas Department of Corrections appears pointing itself in the right direction in developing the MROP and maintaining, albeit through the court order, the program but in conscientiously striving to go beyond the letter of the law.

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Appendix A

The inclusion of this material may give the reader a broader and more accurate picture of the male MR offender.

Additional selected Demographic [illegible] - MROP Male

Crime convicted of:		N = 82
Burglary	24	29.3%
Assault	12	14.6%
Theft	9	10.8%
Parole Violation	9	10.8%
Possession of Drugs	8	9.8%
DWI	4	4.9%
Robbery	4	4.9%
Probation Violation	2	2.4%
Indeceny	2	2.4%
B & E, Forgery, Sex, Arson, Att. Murder, Bad Checks, Manslaughter, Receiving Stolen Goods	1 each	1.2%(9.8%)

Times in TDC:		N = 86
1x	40	46.5%
2x (Recidivist)	29	33.7%
3x " "	10	11.6%
4x " "	5	5.8%
5x " "	1	1.2%
6x " "	1	1.2%

Substance Abuse:		N = 95
Drug	40	42.1%
Alcohol	36	37.9%

Number of Jobs held:		N = 98
None	3	3.1%
1	12	12.2%
2	16	16.3%
3	26	26.5%
4	18	18.4%
5	19	19.4%
6	3	3.
7	1	1.0%

Longest Stay on Job: (in months)		N = 84
Range	=	1 mo. to 360 mos.
Mode	=	24 mos.
Median	=	36 mos.
Mean	=	59 mos.
		35 mos.(substracting N=12 of those 120 mos.+ on one job)

Handicapping Conditions:		N = 99
Yes	=	65
No	=	34

Sample listing of predominant chronic conditions:
Visual
Hearing
Orthopedic
Diabetes
Seizure disorder
Cardiac
Polio

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LATE EFFECTS OF POLIOMYELITIS: IMPLICATIONS FOR VOCATIONAL ASSESSMENT AND REHABILITATION

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Abstract

In the United States there are 250,000 survivors of paralytic polio. Twenty-five percent of this group may be experiencing new health problems related to earlier infection with polio. Individuals initially contracted polio, were able to regain much of their function and maintain neurologic stability. Polio was felt to be a conquered disease by the medical profession, individuals, and society. Approximately 20 years ago existing support organizations and research for polio victims were disbanded. Presently no national organization exists to represent polio survivors and sponsor research to investigate the latent effects. Symptoms are reoccurring approximately 30 years post onset. Many are at the peak of their careers since the mean age of individuals with reoccurring symptoms is 46. Among new health problems fatigue was reported most frequently followed by weakness in previously affected muscles, muscle pain, joint pain, weakness in previously unaffected muscles and difficulties breathing. ADL problems most frequently reported are; new difficulties with walking, climbing stairs, bathing and transfers. These problems have significant vocational and psychosocial implications due to the negative impact on an individual's ability to maintain previous levels of productivity. Vocational assessment must incorporate significant medical and functional issues into an in-depth job analysis to enable the counselor to identify work tolerance and specific work tasks the individual is experiencing difficulty in performing. Accurate assessment will permit relevant collaboration and vocationally relevant evaluation from appropriate therapeutic disciplines, provide pertinant facts to base vocational plans and offer specific recommendations to the individual and employer. Vocational assessment and rehabilitation must be tailored to the specific etiology of the latent effects of poliomyelitis so that individuals currently experiencing these effects may maintain a level of productivity within their tolerance and continue to lead a vocationally rewarding life.

Poliomyelitis is often thought of as a stable chronic disease. Following acute illness and a period of rehabilitation, the individual was thought to have achieved a plateau of neurological and functional recovery which would remain relatively stable for the remainder of their lives.

> Based on data from the National Center of Health Statistics, Atlanta, Georgia there are an estimated 200,000 to 250,000 survivors in the United States with paralytic polio. According to a preliminary study from the Mayo Clinic ... approximately 25% of this group may be experiencing new health problems related to their earlier infection with polio ...
>
> Four factors present at onset were strongly associated with developing the late effects of polio many years later. These were (1) hospitalization at onset; (2) contracting polio over the age of 10; (3) ventilator use; and (4) paralysis in four limbs at onset. For persons who had any one of these four risk factors, the median time post-polio to onset of fatigue was under 30 years. Of these four risk factors, the need for hospitalization, ventilator use and paralysis in four limbs, in all likelihood reflected a common underlying variable - namely, severity at onset. Thus, the two most important predictors of whether someone would develop late changes and when were age at onset and severity at onset.
>
> Among the new health problems, fatigue was reported most commonly (87.3%), followed by weakness in previously affected muscles (81.5%), muscle pain (75.5%), joint pain (75.4%), weakness in previously unaffected muscles (71.3%), and new difficulties with breathing (41.9%) ... Among the ADL problems, new difficulties with walking were reported most frequently (82.2%), followed by difficulty in climbing stairs (81.4%), with bathing (61.1%) and with transfers (51.2%).

This information is taken from my co-author, Lauro Halstead and Wiechers (1985), who are pioneers in the research of late effects of poliomyelitis.

Andrea Marhefka (1985) states that one explanation for these changes centers on dying of anterior horn cells.

As part of the normal aging process our bodies experience a decrease in the number of cells in the spinal cord which transmit nerve impulses to the muscles and cause them to move as we want them to. These cells are the ones destroyed or damaged in an acute attack of polio.

According to the theory, the horn cells that are left must take over those that are killed but eventually the strain and overuse becomes too great and the survivors, too, begin to die off. In contrast, persons who have not had polio can lose a considerable number of anterior horn cells as they age without experiencing any serious muscular weakness.

These factors have significant vocational and psychosocial implications for the individual who has fought to overcome the debilitating effects of polio. Victims of paralytic polio have been striving to lead a relatively normal lifestyle, have reached significant levels in their career development, and, once again, are being challenged by latent effects 20 to 40 years post onset. These individuals must now confront the maze of diagnostic evaluations and tests which serve to give credence to the fact that new significant changes in their bodies are occurring. Presently, the long-term outcome is not fully known or understood.

The vocational implications are significant. Presently vocational problems include:

(1) Fatigue experienced on the job. This is an inability to complete the work day without experiencing mild to extreme fatigue. Described as the "Polio wall phenomenon" by Dr. Halstead (1985) as a "rather sudden onset of one or more symptoms together such as intense fatigue, headache, weakness, hot and cold flashes, sweating or a feeling like hitting a wall".

(2) Weakness: the individual's inability to perform repetitive tasks. This includes filing, typing, writing, data entry operations, walking, standing, lifting, wheelchair propulsion etc. without experiencing weakness or tiredness in the muscles required to perform those tasks.

(3) Muscle and joint pain. These symptoms interfere with an individual's ability to concentrate and/or restricts movement which may result in reduced productivity or inability to perform required tasks. This is associated with the post polio syndrome of progressive muscular weakness and muscle atrophy. Frederick Maynard (1985) states, "slowly progressive amyotrophy resulting in a gradual decrease in maximum strength and/or endurance of muscles previously involved by polio puts overuse, strain on functionally useful muscles, tendons, ligaments and joints, which can be expected to produce a wide variety of musculoskeletal pain and motion problems".

(4) Difficulties breathing. Difficulty breathing may require a reduction in tasks which require physical exertion, alteration in working or environmental conditions, or the use of assistive respiratory equipment on the job.

(5) Identification and incorporation of assistive devices previously utilized or newly acquired on the job. To compensate for increased fatigue, muscle and joint pain, equipment such as a cane, braces and crutches, manual/motorized wheelchair or three wheeled scooter, respiratory equipment, adaptive office equipment, etc. may be needed. These adaptations may require modifications to the work place to accomodate their use.

In a January 1986 vocational follow up questionnaire, I surveyed 252 TIRR post polio outpatients. To date I have received 106 responses. From this survey we have learned that 62% of these patients are currently employed. Of these, 45% were employed in professional, technical and managerial positions, 21% were in clerical and sales, 6% were in service, 12% were employed in other occupations, and 16% did not respond to any of the categories.

Eighty percent reported new problems associated with their original polio. As a result of the new problems, 7% changed jobs with the same employer, 4% changed jobs to a new employer and 7% changed careers to accomodate their physical needs. Of those continuing in the same job, 28% required job duty modifications, 30% incorporated assistive devices, 28% reduced the number of working hours, and 31% incorporated rest periods.

The survey also indicates to us why the late effects of poliomyelitis are just now starting to surface. Eighteen percent of those surveyed reported new problems associated with their original polio prior to 1978. Eighty-two percent have only noticed or experienced problems in the last seven years. This finding indicates to us that post-poliomyelitis is a relatively new phenomenon which will be facing us with increasing regularity as the mean age of poliomyelitis survivors increases. We all need to become aware of the phenomenon, its effects, and how we can provide relevant vocational assessment and services.

The vocational assessment interview is a critical factor in effectively addressing the identified vocational problems. An in-depth verbal job analysis will enable the counselor to identify work tolerance and specific work tasks in which the individual is experiencing

difficulty. Use of the 1977 VALPAR Physical Functioning Questionnaire Modified for Use with Polio Survivors (Fairhurst, 1986) will assist in the identification and evaluation process, provide detailed pertinent facts to base vocational plans, and will assist in offering specific recommendations. The vocational counselor can then interface with appropriate therapeutic disciplines to achieve vocationally relevant evaluations.

A multidisciplinary approach in achieving vocationally relevant evaluations can include seven steps. These are:

1. Collaboration with the physician. Such information gives the vocational counselor relevant medical information regarding current medical status, stability, prognosis, and allows us to share information gleaned from the vocational assessment interview so that appropriate recommendations regarding employment are offered to the individual and those involved.

2. Collaboration with the physical therapist. Vocational counselors provide pertinent information to the physical therapist from the interview, specifically from the 1977 Valpar Physical Functioning Questionnaire Modified for Use with the Post Polio Survivors (Fairhurst, 1986), so assessment of identified vocationally relevant problematic physical activities may be incorporated into the therapists' evaluation. This allows the physical therapist to achieve a more specific and detailed vocationally relevant evaluation. The physical therapist can then identify and evaluate specific functional work capabilities, identify those specific work activities which require restriction, and give the exact parameters of those restrictions. It further identifies specific work behaviors, such as poor body mechanics that may place the individual at increased risk of injury or musculoskeletal deterioration and provide intervention and guidelines to minimize their risk. An important component would include the development of an individualized exercise program to strengthen weakened muscles. The physical therapist may also identify assistive devices to conserve energy, reduce strain, muscle fatigue, and pain.

3. Collaboration with the occupational therapist. Occupational therapists can identify energy conservation techniques specific to the individual's employment requirements. This may include adaptive equipment to be utilized on the job, principles of motion economy, prescription of orthotic equipment, manual/motorized wheelchair, or three wheeled scooter to address mobility needs, education on body mechanics while performing work tasks, and work simplification.

4. Collaboration with the social worker. Social workers need to assist in identifying the psychosocial impact of the latent effects of poliomyelitis on the individual and significant others, financial resources for identified equipment needs, assistance in applying for social security or disability retirement if indicated, and assistance in transportation and housing if mobility needs demand.

5. Collaboration with community resources. Many community resources are available to meet vocational and psychosocial needs and can be arranged through collaborative effort.

6. Referral to vocational evaluation. If indicated vocational evaluation can further identify work tolerance, transferable skills, aptitudes, potential for retraining, education, and feasible options for alternate re-employment.

7. Ongoing vocational counseling. Vocational counselors need to incorporate information obtained by the vocational assessment interview and other team members evaluations, assist in the vocational decision making process, identify and evaluate employment/training options, collaboration with the employer to maximize return to work, and enhance job seeking skills such as application, resume and interviewing techniques, and address retirement issues or work reduction if indicated.

Once the recommendations are formalized, communication with the employer is essential to increase awareness of latent effects of poliomyelitis. We need to assist in returning the employee promptly to a maximum feasible level of physical function and gainful employment. This may be achieved by assisting the employer in developing appropriate job duty modifications compatible with the employee-patient's physical capabilities, identify necessary worksite modifications to accomodate physical and/or mobility needs, gain acceptance and utilization of adaptive assistive devices on the job, or possibly considering altering employment status. Other vocational options are to consider part time, flex time, or the need for extended rest or lunch periods so the individual may lie down to rest.

For the individual this approach would increase knowledge and understanding of their current physical status and prognosis, increase their ability to realistically estimate their physical capabilities and limitations on the job, assist in their ability to solve problems, identify alternate methods of accomplishing work tasks, and provide accurate information and practical recommendations regarding needed accommodations on the job.

The latent effects of poliomyelitis, though not thoroughly understood, place new demands on the individual and vocational rehabilitation profession. Vocational assessment must be tailored to the specific etiology of the latent effects of poliomyelitis so that individuals currently experiencing these latent effects and those that follow may maintain a level of productivity within their tolerance and continue to lead a personally fulfilling and rewarding lifestyle.

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IMPLICATIONS OF COGNITIVE-BEHAVIORISM FOR VOCATIONAL EVALUATION: Assessing Cognitive and Emotional Components of Performance

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Abstract

Recent theories of behavior describe a multidimensional, mediational model of human functioning. This cognitive-behavioral model presents behavior occuring on a continuum, with cognitive and emotional/physiological responses preceding motoric performance. Many effective counseling and training techniques used in all areas of rehabilitation today are based on this model, yet traditional vocational evaluation methods do not adequately target the kinds of preliminary diagnostic or baseline data needed to plan and implement such techniques. This paper presents some implications which a cognitive-behavioral model holds for assessment of rehabilitation clients and provides examples of cognitive and psychophysiological assessment methods which might be beneficially utilized in the vocational evaluation process.

One of the more recent models of human functioning to evolve from behavioral science is cognitive-behaviorism (Bandura, 1977; Meichenbaum, 1977; Beck, 1976). According to this model, individual behavior consists of a sequence of responses proceeding from stimulus perception to evaluative cognitions, to emotional/physiological responses, and finally to motoric performance. The behavioral response chain described in this model appears as follows:

PERCEPTION→COGNITION→EMOTION→MOTORIC PERFORMANCE

Though functionally related, cognitive, emotional/physiological, and motoric responses may be governed by different controlling stimuli. Studies have shown that these components of behavior do not always correlate with one another (Lang, 1971). For example, an individual may motorically perform very well on a task if he or she believes it is possible, while another equally capable individual who does not believe that he or she can perform the same task, will consistently fail to do so (Gatchel, 1983; Heider, 1958). Thus, full understanding of an individual's behavior or performance under a specific set of conditions, such as a work situation, requires careful assessment of all three dimensions of behavior: cognitive, emotional/physiological, and motoric.

Vocational assessment methods in rehabilitation have traditionally focused primarily on the measurement of overt motoric performance through the use of techniques such as work samples, situational assessment, and dexterity tests (Pruitt, 1977). Certain types of cognitions are routinely assessed using interest and intelligence tests, personality inventories, achievement and aptitude tests, and other self-report instruments. However, relatively little attention has been devoted in vocational rehabilitation to the measurement of client's on-going mediating cognitions or "self-talk" (Ellis, 1963). This class of cognitive behavior includes an individual's immediate appraisals, expectancies, attributions, beliefs, and other covert self-statements. According to cognitive-behavior theory, such cognitions mediate between a specific situation and the individual's emotional/physiological and motoric responses (Mahoney, 1974). The emotional/physiological dimension of behavior is even less frequently evaluated in a systematic way. Vital elements of individual behavior, therefore, remain unmeasured in most vocational rehabilitation assessment situations. Since the cognitive and emotional/physiological components represent critical transitional and even causal links in the individual response chain, they should be systematically measured as part of a comprehensive or "holistic" vocational behavior assessment.

The relevance of cognitive behavioral strategies to a broad range of rehabilitation interventions is documented in recent rehabilitation

literature (Farley, 1985; Sawyer & Crimando, 1984; Farley, Means, Akridge & Rice, in press). Gathering the preliminary diagnostic data required to effectively plan and implement cognitive-behavioral training and counseling necessitates identification of the specific cognitive and emotional/physiological components of a problematic behavior (Kanfer & Grimm, 1977; Beck, 1976). In certain cases, the measurement of the cognitive and/or emotional/physiological aspects of disability behavior can yield the most useful information gathered in a vocational assessment. For example, it is now believed that many disabling conditions are closely related to life stress (Pelletier, 1977; Selye, 1974). Rehabilitation clients experience varying degrees of stress resulting from the pressures of rapid life changes, alterations in physical functioning, loss of financial security, or disruption of family roles. Such stress is expressed through negative cognitions and anxiety, as well as through psychophysiological symptoms such as headaches, muscle tension, pain, or gastrointestinal and sleep disorders (Bishop, 1980; Shontz, 1974). The many adaptations occasioned by disability and illness create an escalating burden of daily frustrations that are capable of producing additional sources of stress for the individual. This secondary stress can lead to even greater psychophysiological dysfunction, physical damage, and complicating medical conditions. The potential for prevention or elimination of these secondary stress-induced disorders in vocational rehabilitation clients makes attention to their identification and measurement of immediate importance.

Cognitive Assessment

Measurement of cognitive functions is especially useful in evaluating depressed clients, anxious clients, or persons who appear to experience repeated failures in spite of having adequate intelligence and training to perform successfully. Other rehabilitation clients who could benefit from attention to their cognitive behavior characteristics include persons with poor self-concepts, unrealistic attitudes, inadequate self-monitoring, and those whose performance dysfunctions are not overtly identifiable (Kanfer & Grimm, 1977; Beck, 1976; Mahoney, 1974). Despite the need for additional research, many of the approaches already developed to measure behavior mediating cognitions can be utilized in vocational rehabilitation. Examples of such instruments include the Irrational Beliefs Test (Jones, 1968); the Assertiveness Self-Statement Inventory (Schwartz & Gottman, 1976); and the Automatic Thoughts Questionnaire (Hollon & Kendall, 1980).

Direct evidence of the value of cognitive assessment in vocational rehabilitation comes from a study conducted by Drake (1985). In this study involving 100 vocational rehabilitation clients from a state agency, Drake used the Health Attributions Test (hAT) to predict rehabilitation progress of the subjects. The HAT (Lawlis & Lawlis, 1980) measures the degree to which individuals perceive themselves as having control of their own health, or whether they attribute their physical well-being to external factors such as luck or powerful others. The test can provide indications of a client's motivation and willingness to work toward recovery or rehabilitation. Using principles of locus of control, the HAT renders scores in three areas: Internal (how much responsibility individuals take for their own health), Powerful Others (the degree to which individuals abdicate control of their health to others), and Chance (the degree to which individuals believe that fate controls what happens to their health). The test consists of 24 statements which are rated on a range from strongly agree to strongly disagree. The HAT may be administered individually or in groups. It takes approximately ten minutes to complete and less than five minutes to score.

Drake used 50 rehabilitation clients classified as disabled due to back pain and 50 clients classified with alcohol/substance abuse disabilities. He found that clients who scored higher on the Internal factor of the HAT were more successful in their rehabilitation programs. Correlations between HAT Internal scores and rehabilitation status after 60 days in the VR program were .3751 ($p < .007$) for the alcohol clients and .2995 ($p < .03$) for the back pain clients. A discriminant analysis showed that this simple HAT measure of client attributive cognitions could predict the alcohol client success in the VR program 96.3% of the time and their failure rates 100% of the time. It predicted success of the back pain clients with 83.3% accuracy and had an accuracy rate of 90% for the unsuccessful ones. Therefore the HAT Internal score was predictive of success in a rehabilitation program at a probability level of .0001. Drake concluded that clients who have more internal health attribution, i.e. tell themselves that they are primarily in control and responsible for their own lives and health, are more successful in a rehabilitation program because they have a stronger personal commitment to success and a willingness to work harder to achieve their goals.

Psychophysiological Assessment

Advances in the field of psychophysiological assessment provide a new and challenging dimension to vocational evaluation. The methods of emotional/physiological or psychophysiological assessment have been developed to the point which would allow vocational rehabilitation personnel to gather direct and specific information on many forms of client psychophysiological responses in a work setting. This kind of measurement can be performed using the monitoring devices marketed for use in biofeedback training. Although the appropriateness and relative ease of use of biofeedback techniques in vocational rehabilitation has been described (Bodenhamer, Bodenhamer & Evenson, 1984; Knight, 1980), biofeedback has been underutilized in the rehabilitation field. Few rehabilitation professionals have received training in the identification, measurement, and definition of strategies for disabilities related to the emotional/physiological aspects of behavior. In order to encourage the use of biofeedback for psychophysiological assessment in vocational

evaluation, the remainder of this paper focuses on providing information on how a psychophysiological assessment approach might fit into the evaluation process.

Diagnostic biofeedback, psychophysiological profiling, and screening procedures have already been developed for the evaluation of client's pre-training emotional/physiological functioning levels, under both resting and task performance conditions (Fuller, 1977; Montgomery & Wood, 1983). Similar assessment procedures can be used in vocational evaluation settings to identify clients who have dysfunctional physiological responses that interfere with vocational task performance (Bodenhamer & Bodenhamer, 1983).

Some clients might show elevated muscle tension or perhaps heightened autonomic reactivity to specific types of work or to certain working conditions, such as noise, close supervision, or small work spaces. Compact portable biofeedback instruments are now available which can be worn unobtrusively by clients as they move around a workshop or evaluation center and perform in a variety of actual work environments.

Two types of biofeedback instruments which are relatively inexpensive and easy to operate and maintain include the electromyograph (EMG) and temperature or thermal unit. An EMG measures the electrical microvoltage which emanates from the contraction of muscle fibers. Small sensors attached to a subject's skin above the monitored muscle groups pick up electrical signals from these muscles. The signals are then converted to visual and/or auditory readings by the machine. The readings can be "fed back" to the subject, who may be able to use this information to regulate the signal and, consequently, his or her own muscle activity. For example, in a biofeedback psychophysiological assessment, EMG measurements could be made of the upper body muscle tension levels of an industrial-accident client who appears physically tense and guarded when performing tasks requiring the use of his or her hands and upper body. Such an assessment could tell the rehabilitation professional and the client if there is excessive tension in the client's upper body during task performance, and even which particular muscle areas are involved. If the extent of muscle tension measured indicates that such contractions may be interfering with the client's execution of desired work tasks, then biofeedback or other relaxation techniques to reduce tension could be made a recommended part of the client's rehabilitation program.

A thermal biofeedback instrument measures the temperature of the skin surface produced by blood flowing through vessels serving the skin area. When blood vessels dilate, allowing more blood to enter a skin area, the skin temperature rises. Anxiety level and other psychophysiological functions controlled by the autonomic nervous system appear to produce fluctuations in skin temperature caused by vasodilation and constriction. The temperature changes can be detected by a small themistor, which can be taped to a subject's finger tip. Using temperature biofeedback, subjects have learned, among other things, to reduce migraine headaches (Wickramasekera, 1973) and hypertension (Green, Green, & Norris, 1980). The rehabilitation client might be a former housewife who, at age 53, following a divorce and subsequent stroke, must learn to support herself. She reports that the prospect of going to work terrifies her, and she manifests numerous signs of anxiety, such as emotional lability, motor agitation, and verbal expressions of self-doubt. Along with an assessment of the client's self-talk cognitions, a biofeedback psychophysiological assessment could be performed as part of her vocational evaluation. This assessment could assist in identifying the specific physiological patterns of the client's anxiety, thus helping to focus her attention on the need to reduce anxiety and the physiological symptoms associated with it. It would provide her with the essential first criterion for self-managed behavior--the ability to self-monitor the problematic response (Kanfer, 1980). Her energies would then be freed for investment in the rest of her rehabilitation program. The biofeedback psychophysiological assessment data would provide justification for including relaxation or biofeedback training in this client's rehabilitation plan.

Biofeedback technology is being used by professionals and paraprofessionals from a wide variety of disciplines (Schwartz & Fehmi, 1982). Rehabilitation personnel are learning to utilize biofeedback equipment for both assessment and training purposes. At the very least, increased understanding of biofeedback methods allows rehabilitation counselors, evaluators and adjustment specialists the option of appropriately referring clients for biofeedback training. The use of biofeedback devices is not difficult to learn, as evidenced by the growing trend toward teaching clients to attach, read, and record their own biofeedback instruments in self-directed biofeedback training programs (Bodenhamer & Coleman, 1983). A systematic relaxation and stress management training curriculum package, which utilizes both cognitive restructuring and physiological relaxation training methods, is currently available for use in vocational rehabilitation programs (Akridge, 1985). Plans are currently underway at North Texas State University's Center for Rehabilitation Studies to offer continuing educational training for vocational rehabilitation personnel in both the cognitive and the emotional/psychophysiological assessment and training techniques referred to in this paper.

Summary

The increased use of a cognitive-behavioral counseling and training model by rehabilitation service providers will create a growing need for the evaluation and specific identification of the cognitive as well as the emotional/physiological aspects of problematic disability behaviors. Now that more cognitive assessment methods and psychophysiological assessment techniques are available, tested, and ready for application within vocational rehabilitation settings, it is time for vocational evaluation and other rehabilitation professionals to make better use of these methodologies for the benefit of rehabilitation clients.

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RESEARCH UPDATE: A VOCATIONAL EVALUATION PROGRAM FOR QUADRIPLEGICS

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ABSTRACT

An update is presented on a research project pertaining to vocational evaluation of persons who are quadriplegic resulting from spinal cord injury. The project focuses primarily on quadriplegics who are not candidates for higher education or who choose not to attend college. The developmental phase covers 1) identification of job options for quadriplegics including labor market data; 2) utilization of a job matrix process to document commonalities among the jobs identified; 3) review of assessment tools in terms of feasiblility for performance by the quadriplegic population as well as for matching tools to measure potential to perform tasks associated with identified jobs. Job modification procedures and compensatory techniques are also discussed. A vocatonal evaluation program for quadriplegics has been initiated and program evaluation has been established to measure its effectiveness. At the end of the project, a comprehensive and final report will be submitted to the rehabilitation community.

At The Institute for Rehabilitation and Research (TIRR) in Houston, Texas, we are concerned with the vocational rehabilitation of persons with spinal cord injury. In addition to our service delivery programs, we have also been involved in vocational research for many years. Currently we have a five year NIHR sponsored research project which is concerned with the development of a more accurate vocational evaluation for persons with quadripligia resulting from spinal cord injury. The project specifically focuses on persons who are not candidates for higher education or who choose not to attend college. The majority of quadriplegics fall in this category as statistics revealed that 57% of them have a high school education, 35% have less than a high school education, and more than 85% of them are unemployed (National SCI Data Research Center, 1978, 1979).

Questions continue to be raised whether current vocational evaluation programs simply fail to identify vocational potential or whether most quadriplegics with a high school education or less truly lack vocational potential. Several investigators (Berstein and Karen, 1979; Moed, 1961; Schlenoff, 1974; Siegel, 1969; Spangler et al, 1961) have questioned whether the tools of assessment, often involving psychomotor skills and performance, measure intended aptitudes and abilities, or whether such tools measure only degree of impairment.

In our research update, data only on the developmental phase will be presented. Three basic tasks were involved.

Task 1. Identify Realistic Job Options for Quadriplegics

Before developing a vocational evaluation program, an answer must be provided to the fundamental question of what it is one proposes to evaluate. In our project, we selected the answer -- to evaluate ability of quadriplegics to learn and perform tasks associated with jobs that do not require a college degree. With this objective, we realized that our first task was to find out what the job options are before developing a process to determine potential.

To date we have identified 497 D.O.T. job titles that we have judged to be within the realm of quadriplegic's physical capacity and which do not require a college education. Table I presents the destribution of these jobs by occupational categories.

These jobs were identified through 1) review of reference sources (Alfred, 1979; Crewe et al, 1978; Laurie, 1975) which contain

descriptive employment data about quadriplegics and other severely physically impaired persons who have been employed; 2) review of placement records of TIRR and state vocational rehabilitation agencies; 3) job duty analysis of all light and sedentary jobs in the Dictionary of Occupational Titles (D.O.T.) (1977).

Table I Job Options for Quadriplegics by Occupational Category

Occupational Category	No. of Jobs in D.O.T.	No. of Jobs Options for Quads
Professional, Managerial, Technical	1,498	2
Clerical & Sales	950	154
Service	546	6
Agricultural, Fishery, Forestry	233	0
Processing	2,793	33
Machine Trades	2,172	143
Benchwork	2,330	142
Structural	841	0
Miscellaneous	915	17
TOTAL	12,278	497

Subsequently we attempted to identify the occupational outlook for these 497 jobs in Texas and in the Houston area. Although job market data is not available by D.O.T. job titles, three recent publications (Botterbusch, 1985; Field, 1984; Vegt, 1984) have become available permitting crosswalks between D.O.T. job titles and other job classification systems that do provide labor market statistics.

The project staff selected to relate the D.O.T. job titles to the Census Code Job Classification System. This system groups the 12,000 D.O.T. titles into 503 generic job titles, and provides labor market statistics by city, state, and nationwide. Statistics are based on the 1980 census survey of approximately 85 million households in the United States. Through statistical procedures, labor market data can be updated annually.

The 154 D.O.T. clerical jobs identified as feasible for quadriplegics were classified under 44 Census Code titles. Since many D.O.T. jobs are compressed into a single Census Code, labor market analysis became difficult if only one of the D.O.T. jobs is applicable to quadriplegics out of 25 to 50 that are not feasible for quadriplegics. Consequently an adjustment was made to select Census Code job titles with 50% or more representation of D.O.T. job titles feasible for quadriplegics. The end results produced 24 Census Code job titles. These are listed in Table II with the numbers of persons employed in these jobs in Texas and in Houston. The starting wages for these jobs range from $4 to $7 an hour.

The current update on the 143 machine trades and 142 benchwork occupations is discouraging. We have become aware that there are far more machine trades and benchwork job titles compressed under a single Census Code title than under clerical occupations. For example, Census Code 785 - Assembler comprises more than 600 D.O.T. job titles. Of this group, we have determined that there are possibly 25 assembly jobs that quadriplegics may be able to perform. According to labor market information there are more than 11,000 assemblers in Houston. How are the +600 D.O.T. jobs distributed among the 11,000 employed workers? How many of the 25 assembly jobs identified as feasible for quadriplegics exist?

Table II Job Options for Quadriplegics by Census Code Job Titles

Code No.	Census Title	1984 No. of Persons Employed Texas	1984 No. of Persons Employed Houston
316	Interviewer	8,817	1,926
318	Transportation Ticket & Reservation Agents	8,010	2,488
319	Receptionists	36,326	9,920
323	Information Clerks, N.E.C.	6,166	1,461
325	Classified Ad Clerks	792	153
327	Order Clerks	20,559	4,657
328	Personnel Clerks, Except Payroll & Timekeeping	5,541	1,146
336	Record Clerks	9,548	2,289
337	Bookkeepers, Accounting & Auditing Clerks	134,440	30,566
338	Payroll & Timekeeping Clerks	9,910	2,811
339	Billing Clerks	7,653	2,303
343	Cost & Rate Clerks	6,018	1,238
344	Billing, Posting, & Calculating Machine Operator	3,261	639
348	Telephone Operators	19,793	4,701
353	Communications Equipment Operator	601	151
359	Dispatchers	6,589	1,907
363	Production Coordinator	14,617	3,838
373	Expediters	6,307	2,125
375	Insurance Adjustors, Examiners, & Investigators	10,891	2,648
377	Eligibility Clerks, Social Welfare	692	90
379	General Office Clerks	85,710	20,176
384	Proofreaders	1,348	316
386	Statistical Clerks	9,552	2,191
389	Administrative Support Occupations, N.E.C.	23,650	6,077

Consequently, we embarked on our own labor market survey. To date we have telephoned 72 companies in 21 cities in Texas to investigate 166 of the D.O.T. jobs. We utilized a list of Texas companies and industries identified by Standard Industry Classification (SIC) codes for which there are also crosswalks to D.O.T. jobs. The results of the survey are presented in Table III.

Table III Results of 72 Industrial Contacts to Locate D.O.T. Jobs in Machine Trades and Benchwork Occupations Appropriate for Quadriplegics

D.O.T. Job not available in Texas Industries	50%
D.O.T. Job is obsolete	4%
D.O.T. Job is task of a larger job	4%
D.O.T. Job exists but extra duties beyond quad's physical capacity (i.e. janitorial, material handling)	26%
D.O.T. Job exist, and appropriate for quadriplegic	16%

Based on current employment trends it appears that the best job options for quadriplegics who are not college bound are in clerical related occupations.

Task 2. Development of Job Task Matrix

With the identified clerical jobs that were determined as feasible for quadriplegics, we proceeded to follow Dunn's (1975) recommendations of developing a job task matrix. The objective was to find commonalities and similarities among the job duties under each Census Code job title as well as across the 24 Census Code titles. The steps required listing the job duties for each of the D.O.T. titles under a single Census Code and then combining the job duties that were similar. When this was completed then we combined the job duties listed under the 24 Census Code job titles. The composite job duties were classified into four categories: communications, data handling, computational, and office machine operations. An example of the end result of a matrix for a single Census code is presented in Table IV.

It must be pointed out that there are a number of incidental tasks associated with all clerical jobs that are not reported in the D.O.T. Most likely performance is taken for granted, but can present major obstacles to quadriplegics. For example, attaching paper clips to sheets of paper; using a staple remover to remove staples from a thick stack of sheets; placing materials in a clasped file or notebook; handling bulky files and materials; performing other similarly related tasks. In working with quadriplegics, every task, no matter how minute or incidental, has to be investigated and resolved.

Task 3. Development of the Vocational Evaluation Process

Having identified clerical jobs that quadriplegics can pursue and the duties associated with these jobs, we proceeded to develop a process to evaluate a quadriplegic's ability to learn and perform these job tasks.

During the early stages of this project, we initiated a comprehensive review of existing work samples and vocational tests to determine

Table IV. Example of Matrix for Single Census Code Job Title

348 TELEPHONE OPERATORS

Composite Job Duties

Communications

1. Obtain personal/financial data from customer/applicant/ public
2. Assist customer/applicant/public in preparing/ completing forms
3. Receive and answer inquiries/requests from customer/ applicant/public
4. Provide information about services/facilities/programs/ policies
11. Receive callers/visitors and direct to destination
12. Relay incoming, outgoing, and interoffice calls/messages
13. Arrange and schedule appointments/services

Data Handling

1. Record data obtained from customer/applicant/public onto standard forms
2. Record/copy data obtained from other records/forms
4. Read and examine records for completion/accuracy and make corrections
7. Sort and classify data into sequences/groupings
8. File data and maintain files/records
12. Route data to appropriate departments for action/ disposition
19. Receive and record payment/fees and issue receipt

Computational

2. Total/tally amounts
3. Make change
5. Compute value using rate tables/references

Office Machines

3. Cord or cordless switchboard
8. Computer terminal
9. Public address system
10. Electronic monitoring panel
11. System of bells/buzzers to page individuals
14. Calculagraph

which assessment tools could be administered to quadriplegics. To date the project staff has reviewed 334 vocational assessment tools. Specifically, the staff has reviewed 13 commercial vocational evaluation systems comprising 276 work samples; 53 non-commercial work samples available through the Materials Development Center; 10 work samples developed at The Institute for Rehabilitation and Research; and 50 psychometric tests covering intelligence, interests, academic achievement, and aptitudes. Of the total number reviewed by a criteria which we established, 55 commercial work samples, 18

non-commercial work sa[illegible], and 15 psychometric tests were judged to have relevance for quadriplegics.

From among the appropriate assessment tools for the quadriplegic population, we have attempted to match those that appear to measure the duties of the clerical jobs that we have identified. This haa been a comparatively easy taak, but interpretation of results require careful considerations. It must be remembered that skillful performance on a work sample does not always mean that a quadriplegic can physically apply such skills in an actual job. For example, most of the filing work aamplea require a person to file index cards in alphabetical or numerical order and insert them into a small file box. While ability to file has been assessed, a quadriplegic may not be able to file materials in heavy and claaped file folders or be able to place such files in cabinets or on shelves which apan to the ceili[illegible]

Further psychometric tests which require even less phyaical performance than work samples, provide even less information about a quadriplegic'a physical ability to apply an identified aptitude to an actual job.

In addition to asaessment tools, we have attempted job modifications through investigation of commercial clerical toola and aids that may facilitate a quadriplegic's functional performance. We have purchased such items as electric atapler, electric letter opener, paper crimper to substitute for paper clipa, rubber finger tipa to facilitate paper grasp, calculator stands to place calculator at an angle for better reach and operation, and other similar itema. We have not located a commercially available solution for removing staples, and we are still exploring ways to set up filing aystems that would be easier for quadriplegics to handle.

As part of job modifications, we have also focused on compenaatory techniquea, that ia, performing taaka in ways different than the able bodied person would do. In the absence of an electric atapler, we have demonstrated how quadriplegica may be able to uae forearm or elbow force to hit the head of a atandard atapler. Without an electric letter opener, we have demonstrated that a quadriplegic person can use teeth to chew off the short end of the envelope, blow into the envelope to inflate, and then use teeth to remove letter. For select aasembly work, we have demonstrated that some quadriplegica can hold objecta in the crease of one arm while using opposite hand and arm to perform the assembly task.

As of January 1, 1986 we have incorporated the vocational evaluation process into the vocational delivery system. Our model includes psychometric testing, work samples, simple work modifications, training in compensatory techniquea, and some situational aasessment. We have set up a program evaluation aystem to measure the effectiveness of our program. At the completion of the project a final report will be prepared and distributed to the rehabilitation community. This report will contain 1) details of the process of identifying job options and list of appropriate jobs for quadriplegics; 2) details of criteria in selecting assessment tools and list of appropriate tests and work samples relevant to the quadriplegic population; 3) description of the developed vocational evaluation process; 4) outcomes of the program evaluation; 5) guidelines for replicating the vocational evaluation process; 6) recommendations for future research and strategies.

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Visual performance of the visually impaired worker as a function of contrast, illumination, and low vision aid usage.

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The current study investigated the effects of illumination and contrast on the productivity and comfort of low vision workers, some of whom used low vision aids. The study was guided by several specific objectives: (1) to develop strategies for testing and identifying optimum illumination levels and color contrasts for severely visually impaired persons, (2) to gain some indication of the type and degree of variation among individuals in identified optimum conditions across individuals, (3) to develop strategies for modifying work sites to incorporate such environmental enhancers in a visually meaningful way, (4) to determine the impact of work site modifications on the productivity and comfort of these workers, (5) to determine the impact of low-vision aids on the productivity and comfort of these workers, and (6) to establish the contribution of low vision aids to the efficacy of environmental modifications.

Low-vision subjects (N=13), several of whom first received low-vision aids were tested with respect to various illumination levels and color contrast conditions to identify an optimum level of lighting and color contrast for each subject. Assessment results indicated that for at least some individuals, specific lighting conditions and color contrasts were related to better performance, but there were considerable individual differences in terms of what constituted optimum conditions for each subject and to what degree optimum conditions facilitated visual performance.

The job-site of each subject was modified in accordance with that subject's optimum illumination and color contrast conditions. The subjects, most of whom were employed in industrial sewing jobs, received each modification separately and in combination in a prearranged sequence. Before and after each modification (or treatment) phase, the modifications were withdrawn, resulting in non-treatment phases alternating with treatment phases. The dependent measure was productivity rates.

There was considerable variability among the subjects. Some subjects exhibited higher production rates related to one or more of the modifications, while others did not. Of those who did, better performance was related to the light modifications and not to color modifications. Baseline data taken before and after the receipt of LVA's indicated increased performance for several of those subjects using LVA's as a function of LVA usage.

Subjects were also asked to respond to comfort questionnaires designed to measure their attitudes concerning LVA's and/or color and light modifications. The percentage of favorable responses to each type of modification indicated greatest favorability (i.e. most beneficial) to the LVA, next to the light modification, and least to the color modifications. Discussion of results includes implications for assessment and intervention strategies for the visually impaired worker.

A crucial component of the rehabilitation process for visually impaired workers is the enhancement of visual function through the optimization of residual vision. Intervention strategies are numerous, and relate to various aspects of the visual process. Corn (1983) has proposed a model of visual functioning incorporating three dimensions of the visual situation: (1) visual abilities, including the five physiological components of vision -- acuity, visual fields, mobility, brain function, and light and color reception; (2) stored and available individuality, including past experiences and functions influencing individual's ability to react to stimuli, such as cognition, perception, sensory development and integration, and physical and psychological makeup of the individual; and (3) environmental cues, consisting of the attributes of objects which influence their visibility, such as color, contrast, time, space, and illumination. Comparing this three-dimensional model to a balloon, Corn suggests that in order to perform some function, the balloon must contain a minimum volume of air, without stretching too far in any one direction.

The model assumes interactions among the components of the three dimensions. By intervening in any one of the dimensions, it is theoretically possible to increase visual function. Interventions related to the third dimension (environmental cues) are the easiest and least expensive to make. Such modifications might be made by an employer, a counselor, or by a visually impaired individual, to increase the on-the-job visual function of that individual.

Visual work performance is affected by many variables. The ability of an individual to perceive a stimulus, for example, is dependent on both the process of sight and on the geometric and photometric characteristics of the visual environment. One can have good eyesight and yet fail to perceive a stimulus because of improper illumination, inadequate contrast or size, or any number of such characteristics of the visual environment. On the other hand, one may have relatively poor acuity, but experience little functional loss of vision in situations where characteristics of the visual environment are optimized. The interdependence of variables influencing visual performance underlies common practices designed to compensate for losses in visual acuity such as increasing the illumination, the contrast, or the size of the stimulus.

The human eye contains mechanisms which allow it to adapt to a wide variety of environmental conditions and still maintain reasonable efficiency. With respect to illumination levels, for instance, the normal eye is able to make use of very high and low levels of light, but there are nevertheless, certain optimum conditions in which it works best (Hopkinson & Collins, 1970). The same is true for other characteristics of the visual environment as well. Because many eye pathologies serve to limit the adaptability or functional range of the eye, the optimization of visual environment characteristics

is especially crucial to the visual performance of many low-vision persons. Also, because there are many different eye pathologies yielding different types and patterns of functional loss, it appears that there are substantial differences among individual low-vision subjects as to what specific stimulus characteristics constitute optimal visual environments.

The majority of studies which have considered the effects of illumination on the visual functioning of visually impaired populations were not applied to job settings but instead used reading performance as the dependent measure (Gilbert & Hopkinson, 1949; Lehon, 1980; Steiner, 1969). From these studies, it may be concluded that: (1) for most individuals, increasing illumination on a visual task will improve visual performance up to a point, but thereafter improvement will be progressively less for the same magnitude of increase in illumination; and (2) vision-impaired subjects are likely to benefit more from increased illumination (depending on the nature of the preferences of visually impaired subjects in the selection of optimum illumination) than non-visually impaired subjects.

A second variable important for visual performance is contrast. The fact that the human eye can detect not only light but contrast greatly increases the amount of visual information we can see and interpret. A small object can only be seen when superimposed on a larger one if the two differ in luminance (or brightness) contrast, and/or chromatic (or color) contrast. There is also a reciprocal relationship between contrast and illumination such that, in general, greater illumination makes possible the discrimination of objects having less contrast. Conversely, a high degree of contrast between an object and its background allows for visual discrimination even under relatively low levels of illumination. A third factor interacts as well, such that an increase of size has a greater effect on improvement of visibility for objects of weak contrast than for those of strong contrast (Weston, 1945).

Most studies investigating the relationship between contrast and visual performance have considered only luminance contrast. In attempting to optimize contrast, however, it is important to remember that the subjective experience of contrast is a result of both luminance and color contrasts. Color contrast has received some attention as a technique for increasing visual efficiency for visually impaired persons (Corn, 1983; Myers, 1971; Sicurella, 1979). As with illumination, when dealing with visually impaired subjects, optimal contrasts are partially predictable according to the physical properties of luminance and hue, but they are somewhat idiosyncratic as well due to widely differing pathological conditions. Thus, for each variable it appears an appropriate strategy is to individually determine an optimum stimulus configuration of light and color for each subject.

A substantial number of low-vision individuals can be helped to increase their vision through the use of optical aids often referred to as low-vision aids (LVA's). Success in benefiting from an LVA is generally related to the amount of residual vision and also the extent to which the patient can modify acuity by accommodation (the ocular adjustment for vision at various distances). Other factors determining the success in benefiting from LVA's include intelligence, educational background, motivation, specific visual goals (Milder, 1980), and proper training (Mehr & Fried, 1975).

The present investigation was concerned with whether or not (a) optimum illumination levels and color contrasts could be identified for low-vision subjects, and (b) the comfort and/or productivity of visually impaired workers could be improved if the environment were modified to incorporate those stimulus characteristics. Additionally, the contribution of LVA's to this intervention strategy was assessed. Practical and economical assessment techniques were developed to make a functional assessment of each subject. That these assessment strategies be simple, practical, and job-related was a major consideration in their development, in the hopes that they would be widely applicable within the rehabilitation field.

Experiment I

Subjects

Subjects were legally blind individuals employed in industrial sewing jobs at Mississipoi Industries for the Blind in Jackson, Mississippi. Selection of individuals to be considered for low vision aids was made from among all low vision workers employed in jobs for which piece-rate production records were available. Those individuals who (a) were prescribed LVA's and (b) performed jobs suitable for both color and illumination modification to be made in the second experiment, were eligible for the LVA group. LVA examinations and prescriptions were made through the Low Vision Aid Clinic of the University of Mississippi Medical School. Testing was not begun on these subjects until they had successfully completed a two-month follow-up examination. Subjects of the non-LVA condition were matched to LVA subjects on the basis of gender and type of job.

The subjects consisted of four males and nine females with an average age of 33. Diagnosed eye pathologies widely varied with a majority of subjects having multiple visual dysfunctions. All of the subjects had either congenital or early onset visual problems; the majority had progressive conditions.

Apparatus and Materials

The light frame used in the functional assessment consisted of a light track construction with rheostat switches which controlled the illumination levels of each of two incandescent bulbs positioned on either side of the subject's head. A cross-bar acted as a "chin stop" so that a subject's head would be relatively immobile.

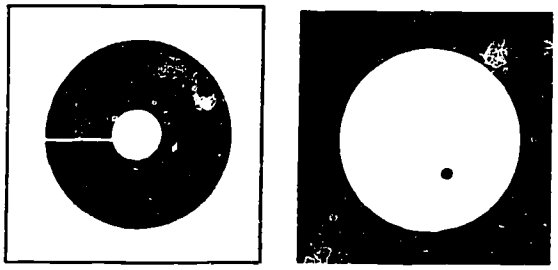
Visual acuity was tested with two sets of eleven cards, each containing E-shapes randomly oriented (up, down, left, right). The E's of the first eight cards were the same size as those of the eight lines of the Illiterate E Acuity Chart. Additional cards displayed smaller sizes. Sets were alternately used and were inverted with reuse to eliminate the possibility of memory-aided test responses.

Two sets of stimuli were used to test each subject for optimum color contrast. The background color of both sets of stimuli for a given subject

matched his/her dominant work material color. For example, a subject who produces barracks bags would view stimulus cards covered in that same type of cloth. The first set consisted of a Landolt-ring task. Each card contained a Landolt-ring in one of 5 or 6 colors which contrasted highly with the work material background color. The break in each ring (which the subject was instructed to locate and indicate with a stylus) varied from 10mm to 1mm in width. The stimulus set consisted of a Landolt-ring of each contrast color, for each of the five break sizes. Breaks were randomly located.

The second set was devised to provide a more difficult visual task for those subjects with only moderate acuity losses. This set was identical to the first in background color and contrasting colors. However, each card contained a circle the same circumference as the Landolt-rings, with a pin-point area missing through which the background color was visible. Pin-points of five sizes were used, varying from 6mm to 1mm in diameter. See Figure 1 for examples of each type of stimulus.

A neutral stimulus card used to set the subject's "comfort levels" consisted of a circle, half white and half black, mounted on a grey background.



LANDOLT-RING PIN-POINT CIRCLE

Figure 1. Example stimuli used to determine optimum color contrast

Procedure

The subject was seated before the light frame apparatus. In order to control for ambient lighting factors, the lighting of the test site was adjusted to replicate the lighting condition of the subject's work site (type of lighting and illumination level). After the subject was instructed to rest his/her chin on the chin bar, he/she was instructed to adjust the lighting level with the rheostat control to the level from which he/she could most comfortably view the neutral stimulus card. The preferred illumination level set by the subject was considered his or her "comfort level." Illumination was measured by a standard light meter and was recorded as foot-candle power. Maintaining the illumination level chosen by the subject, the Illiterate E acuity cards were used to test acuity performance. The subject's score was simply the number of the card (1-11) containing the smallest E's for which the subject correctly distinguished E-direction.

Using this same "comfort" illumination level as a starting point, the footcandle intensity was systematically incremented and decremented using a modified "method of limits" procedure for identifying optimum visual performance. At each footcandle setting, the subject was retested for visual acuity using the Illiterate E cards. Optimum illumination for a subject was operationally defined as the footcandle level yielding best acuity performance. If more than one setting yielded equivalent best performances, that setting nearest the "comfort" level was designated as optimum.

For testing optimum color contrast, the designated optimum illumination level was maintained. The subject was shown the Landolt ring stimulus cards one at a time and was instructed to point out the break in the ring as quickly as possible. A stop-watch was used to measure the response latencies. The same procedure was used with the Pin-point Circle Stimuli. Optimum color contrast was operationally defined as the stimulus color yielding the smallest average response latency over the various size conditions.

All testing materials and the test procedure were pilot tested prior to the study. Specifically tested was the assumption that each subject's optimum color contrast would be the same under other lighting conditions as well. This assumption was confirmed. Although only one of eleven pilot subjects showed 100% consistency across lighting levels, the color contrast yielding best performance for a subject under the optimum lighting level also yielded the best average performance under the majority of other conditions as well.

Results

For the majority of subjects (62%) the footcandle level found to be optimum was the same as the comfort level chosen by the subject; that is, neither an increase or a decrease in footcandles from the comfort level yielded improved performance for these subjects. The acuity measurement appeared to be reliable; subsequent testing under the comfort level condition yielded equivalent performances for all subjects but one who improved performance by one card. That the comfort level and optimum level proved to be the same for so many individuals would seem to indicate that the subjects were quite accurate in predicting the approximate amount of illumination they required for perceiving non-moving, fine visual tasks.

For the five other subjects, an increase in lighting over the comfort level yielded the best performance. Three of them improved acuity by one card; two improved by two cards. Four of those increasing performance were LVA subjects; one was not. No comparisons to baseline were made at this time. The acuity task should be recognized as somewhat less sensitive to small variations in performance. Each card was scored for right versus wrong responses only. Perhaps recording response latencies in this task as well might have increased the sensitivity of the performance measure and resulted in a greater number of persons exhibiting increased performance.

The average increase in illumination over the comfort level was 35 fc. For each subject, the illumination level identified as optimum was an

increase in footcandles from her/his baseline condition. The average increase was 110 fc, ranging from a low of 10 to a high of 250 fc.

Subsequent to all other data collection, acuity was again tested under the various lighting levels (baseline, comfort, and optimum levels) using the same procedures. Of the 11 subjects available for retesting, four exhibited an increase in performance over the various levels (36%). Average gain was 1.25 cards. Although percentages don't significantly differ from the first testing, the results were surprising in two respects: (1) Since baseline lighting was also tested, the various levels of lighting differed more, and would be expected to produce considerably higher rates of increase, and (2) there was only moderate overlap between the two groups of subjects exhibiting increases for the two testing sessions. These results are probably at least partially explained by a further finding relative to the second testing: that is, over half of the subjects (55%) displayed overall decreases in visual acuity. Average performance loss of these subjects was 2.6 cards. For four of these subjects, the losses occurred over a 6-month period, for the other two over a 12-month period.

In the testing of color contrasts, the dependent measure was the reaction time latencies for subject's responses to each color of the stimulus set. The optimum color contrast was that color for which the smallest latencies were obtained. A percentage improvement was computed to indicate to what extent the optimum color improved performance over the stimulus color yielding the longest latencies for that subject. The average percentage improvement was about 9%, ranging from 4% to 14%.

Very small differences, however, may be a simple result of random error. If we arbitrarily choose a 10% increase in speed (when comparing the fastest-performance color to the slowest-performance color) as a cut-off to define a significant increase in performance related to color contrast, seven of the 13 subjects (approximately 54%) exhibited such increases. Thus, for a substantial number of subjects, optimizing color contrast did facilitate this particular type of performance.

The use of LVA's was considered only as a between-subject variable. Since LVA's were prescribed on the basis that increased acuity was obtained with the LVA, subjects who received aids were tested while using their LVA. When comparing the results of testing for optimum stimulus characteristics for non-LVA subjects and LVA subjects, little difference is found. Non-LVA subjects chose somewhat higher "comfort" illumination levels (230 fc compared to 210 fc) than LVA subjects. A greater number of LVA subjects than non-LVA subjects were found to benefit from additional increases in lighting (four out of nine, as compared to zero out of four non-LVA's). The difference in optimum levels is slight (226 fc for LVA's; 230 fc for non-LVA's). Little or no difference between groups was exhibited for any of the performance measures, with the groups having equivalent acuity means under optimum lighting conditions, and having equivalent gains in acuity for optimum color contrast conditions.

Such comparisons should be considered very tentative because of the relatively large variation between subjects and the small number of subjects in each group. The comparison suggests, however, that the use of aids is less critical as a factor influencing performance when the subject is operating under optimum stimulus conditions.

Experiment II

Subjects

Job-site modification and productivity measurements were originally begun on all 13 subjects for whom functional assessments were made and who were located in three separate departments. However, productivity data proved problematic in two departments, so the following description relates to four of the subjects (three LVA's and one non-LVA) employed in the "bartacking" department, performing the task of attaching a heavy off-white drawstring to the dark military green fabric of a barracks bag.

Job-site modifications

The lighting modifications for subjects consisted of increasing the footcandle power falling on the subject's work surface. The lighting strategy was accomplished by either (a) repositioning an incandescent light source closer to the work surface, (b) increasing the intensity (bulb wattage) of the incandescent light source, or both.

All subjects performed a sewing job using various types of modified sewing machines. The color modification consisted of painting the machine part which corresponds to a presser foot on a standard sewing machine. This part is used to hold fabric in place and guide the stitch.

Design

The subjects received each modification (illumination and color) separately and in combination in a prearranged sequence. Before and after each modification (treatment) phase, the modifications were withdrawn, resulting in nontreatment phases alternating with treatment phases. The design was an A-B-A-C-A-D-A single-subject withdrawal design, with A representing non-treatment and B, C, and D representing light-only, color-only, and light-plus-color modification phases. The dependent measure was production rates.

Results and Discussion

Two significant sets of results were obtained for subjects within the barracks bag department. One subject performed significantly better under the light-only conditions than under the non-treatment condition. Another performed better under both light conditions (light-only and light-plus-color) than under other conditions.

These results indicate, then, that for at least some individuals, the lighting variable does influence productivity to some degree. That is, modifying the job-site consistent with an individual's optimum illumination level can produce increases in productivity for some workers. Of the subjects in this department, fifty percent exhibited facilitated performance under increased illumination conditions.

The color contrast modification was less successful in the present experiment. This should not be interpreted, however, as clear evidence that color contrast is a less significant aspect of the stimulus configuration. It may simply reflect

the fact that it is more difficult to modify tasks and job-sites with respect to color contrast in visually meaningful ways. In the current situation, the contrast was made in relation to the work material color, over which the study had no control. Thus, resulting contrast ratios were limited to a certain range which may not have been large enough to strongly influence performance. Also, the specific modifications made in the study (primarily painting presser feet) may not have been particularly effective. It is one thing to identify an optimum color contrast for an individual and quite another to incorporate that knowledge into a meaningful job-site modification. In comparing subjects' acuity performances with the different color contrasts in the first experiment, it was found that just over half of the subjects did exhibit an appreciable difference in performance of the least- and most-facilitating contrast. This suggests that the contrast effect is real, but that the procedures used in the productivity experiment were inadequate for replication of the effect within that situation. Different modification strategies in different circumstances might prove more beneficial to performance.

Also, it is important to note that significant losses in visual acuity occurred for several subjects over the period of study. It is possible that light and color modifications designated as optimum were effective only under the specific testing conditions (including the subject's visual abilities at that time) and might decrease in effectiveness as those conditions were changed. Concerning the two subjects for whom the significant results were obtained, neither experienced any noticeable loss of acuity.

The direct influence of low-vision aids on worker productivity can be assessed for some of those individuals receiving an aid. Pre- and post LVA comparisions were less appropriate for several of the subjects due to the apparent existence of confounding factors. Of the remaining four recipients, comparisons indicate a consistent relationship between the use of the aid and increased productivity. The extent of the increase ranged from 3 percent to 19 percent; the average increase was 12 percent.

One reason for the relatively high success rate for these subjects is probably the fact that LVA's were prescribed specifically for use on their jobs. Only those subjects for whom a job appropriate aid could be identified were included in the LVA group. Many of these individuals had, for whatever reasons, neglected to have had basic eye care for many years. Thus, when a prescription was given for some type of low-vision aid, the benefit to visual function was often fairly dramatic. However, one should recall that increased visual function does not necessarily translate into increased performance with such measures as productivity. Many other variables complicate the relationship between these indices.

As to whether the LVA's contributed to the efficacy of environmental modifications, the data is inconclusive. Group analyses within departments which compared LVA and non-LVA performances indicated no such effect. Variations in performance patterns were as great between subjects within LVA conditions as between subjects across conditions. On the other hand, the two subjects for whom statistically significant data were obtained (comparing treatment and non-modification phases) were LVA subjects.

Comfort Data

Although any gains (or losses) in comfort resulting from environmental modifications is of interest as a separate, critical issue, there is no direct measure of comfort available. The technique fo measurement employed in the present study involved asking each subject, subsequent to production data collection, a series of questions designed to elicit the subject's perceptions of each modification in terms of problems and benefits. Obtaining this measure was delayed until after all treatment phases were concluded so as not to draw any further attention to the actual modifications and possible consequences, to minimize the likelihood of a Hawthorne effect.

However, it should be kept in mind that self-reporting measures which rely on memory must always be somewhat suspect and that subjects will often respond according to their perceptions regarding the experimenter's expectations. Thus, we might expect to receive somewhat more favorable responses to all modifications than are actually perceived by subjects.

Responses were obtained for eight subjects still available subsequent to the treatment phase. They were drawn from all departments, since there is no reason to assume that comfort ratings of the modifications would be affected by changing performance demands. A review of comfort questionnaire results indicates generally favorable responses to all variables. The six LVA subjects for whom comfort data was obtained responded quite favorably. Overall, only 28 percent of the questions concerning LVA's received a response indicating either negative consequences or no benefit. All of these subjects reported at least some benefit related to the LVA.

For the eight subjects rating the lighting modificaton, 38 percent of the responses were negative. Three subjects, two LVA's and one non-LVA, reported little or no benefit from the increase in lighting; one of those reported trouble doing her job with the increased lighting. Oddly enough, it is this same subject for whom significant results were obtained relative to light conditions. This funding should serve to remind the reader that productivity and comfort do not necessarily go hand-in-hand. However, discrepancies of this magnitude are somewhat curious.

The same eight subjects rated the color modification, giving 61% negative responses. Four subjects perceived no benefit related to the color modification, and the same subject as above reported trouble in doing her job with that modification. It is likely that the responses of this subject to both modifications simply reflected a general negative attitude toward the changes without any careful regard for actual consequences to comfort.

Implications for Assessment Strategies

The difficulties of field research are well-known. Studies of this nature are complicated by many factors beyond the researcher's control. The result of such complications is that while the issues may be particularly germane (based as they are on real-world situations) conclusions often must remain somewhat tentative, since the lack of

experimental control does not allow for the complete elimination of alternative explanations for the findings. Further research is necessary to strengthen the conclusiveness of field research findings.

With this qualifier in mind, the following strategies are recommended with respect to performance enhancement through environmental modifications:

1. Individualized testing should be done. Low-vision individuals differ widely in terms of what type modifications are benficial, and the extent to which they may benefit.

2. Frequent retesting is appropriate for individual's with progressive eye conditions. As changes occur in a person's acuity and field characteristics, it is to be expected that visual needs will change as well. For all low-vision persons, periodic retesting with age is recommended.

3. Testing for optimum environmental enhancers should be job-specific. Visual needs are somewhat task-specific, depending on the individual's work strategies, experience with the task, and the nature of the task. An identified "optimum" for one particular task will not necessarily benefit the individual in doing many other tasks and activities. The testing should incorporate as many components (i.e. visual demand characteristics) as possible. The need exists for a protocol to assess the visual demands of specific jobs.

4. Specific environmental modifications should be strategically devised and refined. Knowledge of optimum conditions for an individual is worthless if attempts to modify his/her environment fall short of incorporating those characteristics in a visually meaningful way. This is an especially critical point to make regarding such stimulus characteristics as color contrast, which are not so easily incorporated into some job tasks. Job analysis and visual demand assessments can help to identify what environmental characteristics are both a) modificable, and b) visually meaningful.

5. Where feasible, flexible modifications should be incorporated. A good example of this strategy applied to illumination is the use of rheostatically controlled lighting which an employee can adjust according to need. An example of flexible contrast capabilities is the computer terminal which allows for the selection of figure and background colors. It is important to remember that the conditions which are optimum for a task of limited duration are not necessarily always beneficial. For example, while a very high level of illumination may increase visual function for specific tasks, that same level may result in eye strain or glare discomfort if used for long hours at a time. It is also likely that an individual's visual needs may change according to various internal states and external conditions. Thus, modifications which themselves can be modified are likely to be the most efficient.

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TRANSITIONING SPECIAL EDUCATION STUDENTS FROM SCHOOL TO WORK: DEVELOPMENT OF THE PROJECT PERT VOCATIONAL ASSESSMENT MODEL

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Abstract

The paper demonstrates one project's effort at meeting the needs of learning disabled and mentally retarded youth for high quality vocational/technical training and transition services. Through cooperative agreements, the resources of education and rehabilitation are combined in an effort to provide services to those students who have the potential for developing vocational/technical skills. Emphasis is placed on developing interagency cooperation, planning and innovative problem solving techniques. The use of vocational assessment information in the development of the vocational component of the IEP is discussed.

Services provided by the fields of vocational rehabilitation, special education and vocational education are influenced by public laws and regulations. As national priorities change, systems must respond by developing and implementing programming to address these changes. May (1985) has noted that "the commercial marketing purpose of rehabilitation companies,or private practitioners, is to direct its resources toward the needs, interests and expectations of people in the various markets that they attempt to serve". Although public rehabilitation is not attempting to make a profit,it is trying to provide the best possible services to its clientele in the most cost effective manner possible. To be successful in providing these services,a complete understanding of the concerns and needs of the new target populations and markets must be developed.

One of the new national priorities of the Office of Special Education and Rehabilitation Services (OSERS) is that of transitioning special education students to postsecondary training and employment (Will, 1985). This effort requires the cooperation of special education, vocational education, and rehabilitation systems.

In order to understand the changes necessary to focus on the improvement of transitioning programs and services for all individuals with disabilities, OSERS has defined transitioning in the schools as follows: "A process encompassing a broad array of services and experiences that lead to employment. Transition is a period that includes high school, the point of graduation, additional postsecondary education or adult services, and the initial years of employment. Transition is a bridge between the security and structure offered by the school and the opportunities and risks of adult life. Any bridge requires both a solid span and a secure foundation at either end. The transition from school to work and adult life requires sound preparation in the secondary school, adequate support at the point of leaving, and secure opportunities and services, if needed, in adult situations. Since the services and experiences that lead to employment vary widely across individuals and communities, the traditional view of transition as a special linking service between school and adult opportunities is insufficient. The present definition emphasizes the shared responsibility of all involved parties for transition success and extends beyond traditional notions of service coordination to address the quality and appropriateness of each service area." (Will, 1984)

Transitioning, as defined above, and the commitment on the part of OSERS to develop models for the provision of effective, efficient transition service delivery across agencies,

requires a high level of cooperation between special education, vocational education and rehabilitation. Interagency collaboration is essential when addressing one particular area of emphasis in the transition movement; the provision of services to mildly mentally retarded and learning disabled special education students in their transition from secondary education to postsecondary options and employment.

As a result of funding under the Carl D. Perkins Vocational Education Act (P.L.98-524,1984) school systems are required to provide vocational assessments as a component of ensuring equal access to vocational education programs for handicapped students. School systems, based on available resources, have the option of providing such assessments within the local education agency or entering into cooperative agreements with vocational and rehabilitation centers to assist in the assessment of interests, abilities and special needs of handicapped students.

As an increasing number of school systems opt for cooperative agreements with vocational and rehabilitation centers, rehabilitation professionals must become familiar with the needs of the school-aged handicapped population and those of the schools. This paper will focus on the issues involved in definind the school-aged population and development of a model for transition services; specifically, the development of the vocational assessment component of the model. Additionally, the importance of interagency planning, the issues involved in educational and rehabilitation cooperative planning and the problem solving process will be outlined.

The Need for Coordinated Transition Services

The need to prepare youth and young adults with skills for independence, employment and successful life adjustment has long been recognized and advocated by professionals from the fields of special education, vocational education and vocational rehabilitation. Despite this awareness, vast numbers of handicapped individuals have passed through their formative years without developing the vocational skills necessary to prepare them for successful transition from the school environment to the community and the work place (Levinson & Capps, 1985; Peterson, 1981; Peterson, 1985; Poplin, 1981; Szymanski & Danek, 1985).

Recent labor market statistics describing employment and training of handicapped youth and young adults reveal an acute problem. As reported in 1978, in a four-year period, 2.5 million handicapped youth left our nation's public school systems. Of that number, only 23% were either fully employed or enrolled in college, 40% were under-employed or on welfare, 8% were in their home communities and idle much of the time, and 3% were reported to be totally dependent and institutionalized (Brolin & Gysbers, 1979).

Although these national statistics reflect the employment and training needs of all disability groups, the figures are particularly applicable to the mildly mentally retarded and learning disabled students. They represent 50-60% of the population of handicapped youth and young adults served by the public schools.

Since 1978, the situation has improved little. Wehman, Kregel and Seyferth (1985) provide an example of the employment problem among mentally retarded young adults. Three hundred mentally retarded young adults leaving secondary special education programs in Virginia between 1979 and 1983 were surveyed. Of those surveyed, only 28.6% reported full time employment, with 13% reporting part time or sheltered employment. Sixty-nine percent of respondents reported receiving some form of unpaid vocational training. The interviewers' impressions were that the majority of persons responding had received no formal vocational education, although no survey questions directly addressed this issue. Frequent vocational rehabilitation counseling services were reported by 2.2% of respondents, with 22% reporting receiving limited services from a local rehabilitation counselor. Regarding types of employment held by survey respondents, the study indicates that 53% of those working reported employment in janitorial services, food service or sheltered employment.

The above information was obtained from a population in which 60% were classified as mildly mentally retarded. However, Wehman, et al. (1985) indicated that these figures correspond to findings of other special education follow-up studies.

Employment information for individuals with learning disabilities is not much brighter. In a survey of 98 learning disabled adults requesting vocational rehabilitation services, 38% were found to be unemployed. This figure should not be surprising, given that the respondents were seeking vocational services. It is surprising, however,that 381 (41%) of the respondents reported receiving vocational and career education while in high school. Of the 30 individuals who received trade or technical training, 80% indicated that it was helpful to them. This survey demonstrates that a significant segment of the learning disabled population is in need of appropriate vocational and career education (Steidle, E., Sheldon, K., Hoffman,F.J., Sautter, S.W., Minskoff, E., Baker, D.P., Echols, L.D. & Bailey, M.B., 1985).

Wehman, et al. (1985) and Steidle, et al. (1985) highlight the importance of developing a model of transition services which coordinate the efforts of special education, vocational education and rehabilitation services. They demonstrate the necessity of ensuring that career opportunities and vocational experiences are based on individual needs rather than traditional programming practices.

The Project PERT Concept

The successful transition from school to postsecondary opportunities for learning disabled

and mildly mentally retarded youth and young adults, including education, employment and the provision of living arrangements, requires a complex array of services and resources (Szymanski & Danek, 1985). These individuals, their parents and professionals are often faced with uncertainty regarding the availability of services, eligibility requirements and approaches to use in accessing services. Effective transition of disabled individuals from school to adult life requires that relevant, community based opportunities and service combinations be developed to address individuals needs through transition planning and case management.

The Purpose of the Project

In an effort to respond to the needs of learning disabled and mildly mentally retarded youth and young adults for high quality vocational/technical training and transition services, the Virginia Department of Education, in concert with the Virginia Department of Rehabilitative Services, has developed a model demonstration project entitled "Postsecondary Education/Rehabilitation Transition for the Mildly Mentally Retarded and the Learning Disabled" (Project PERT). Project PERT is designed to provide LD and MMR students with:

(1) a continuum of vocational programs and services including vocational evaluation, vocational counseling, work adjustment, independent living skills development, vocational exploration, vocational training, job placement and job maintenance services;
(2) opportunities to pursue articulated vocational programs which span secondary and postsecondary school settings;
(3) programs which provide for the development of extended career ladders; and,
(4) an education/rehabilitation service delivery system which allows for the smooth transition of MMR and LD individuals from secondary schools to postsecondary training to independent employment and successful life adjustment.

The project is designed to develop a procedure for identifying and serving learning disabled and mildly mentally retarded students who have the potential for developing sophisticated vocational/technical skills, if provided with a longitudinal program which combines the resources of education and rehabilitative services. During the first year of Project PERT implementation, this procedure was demonstrated in six local school divisions which represent the following geographically and demographically distinct entities: urban, suburban, rural with an industrial base and rural without an industrial base.

The ulitmate goal of the project is to provide an articulated system which will ensure that all handicapped students who can benefit from rehabilitation services have appropriate transition plans and are provided with a smooth transfer in case management from the education system to the rehabilitation system.

A critical element to attaining this goal is the formulation and operation of Model Implementation Teams (MITs) within each locality. A model implementation team is comprised of individuals representing special education, vocational education, the local field office of DRS and Project PERT. The MIT is responsible for identifying the students for project participation and for planning educational and rehabilitative services for these students.

Project PERT serves the Commonwealth of Virginia from the Woodrow Wilson Rehabilitation Center, a comprehensive rehabilitation facility, offering pre-vocational, vocational and medical rehabilitation services. The Vocational Evaluation Department at WWRC provides the personnel and facilities for the initial and supplemental evaluations offered through the project. These evaluations are implemented as two to four week residential programs which provided to project participants during the summer. Additionally, all support services of the Woodrow Wilson Rehabilitation Center are available to project participants, as needed.

Reflecting the commitment to interagency cooperation, the Project PERT staff is comprised of professionals from education and rehabilitation. Dr. Patricia D. Poplin, Supervisor, Programs for the Mentally Retarded, Virginia Department of Education, serves as Project Director. The Virginia Department of Rehabilitative Services provides the project with Co-Directors Thomas E. Bass and Wendell L. Coleman. Mr. Bass is a Program Supervisor for DRS, Community Rehabilitation Services Division, and acts as the department's liaison with the Department of Education. Mr. Coleman is Director of Vocational Training at Woodrow Wilson Rehabilitation Center. Day-to-day operation of the project is supervised by Joseph M. Ashley, Project Coordinator. Mr. Ashley is a Certified Rehabilitation Counselor who provides experience in conducting a federally funded project at WWRC. Project staff consists of case management and clerical personnel with varying backgrounds in education and rehabilitation.

The Model

The Project PERT four-stage model is the result of cooperative development between education and rehabilitation. Figure 1. visually depicts the model.

Stage I is initiated with identification of students for participation from the target populations and continues through the summer initial evaluation. The Project PERT initial evaluation is comprehensive in nature and consists of a vocational assessment, independent living skills assessment, and an assessment of the student's leisure skills.

Stage II is highlighted by the MIT's joint planning of revisions, as necessary, to the IEP, based on data obtained through the initial evaluation recommendations for vocational programming. Also occuring in stage II is the provision of technical assistance to school

Figure 1. A model for education/rehabilitation transition: The Project PERT approach. The Project PERT model is a four-stage process for the transition of learning disabled and mildly mentally retarded special education students from secondary education through postsecondary options to employment.

systems and vocational educators on implementation of the recommendations to ensure student progress toward vocational goals. Student progress is monitored throughout the school year. The MIT meets in January for a mid-year review to determine if supplemental evaluation in the areas of work adjustment, trial training, vocational evaluation/classroom try-outs, or independent living skills will be necessary. The Project PERT supplemental evaluation, or other appropriate services, conclude Stage II.

Stage III begins, as does Stage II, when the MIT meets to review information obtained during the summer and to make recommendations for IEP revisions, plan monitor visits and determine technical assistance needs for the school year. The Stage III mid-year review is aimed at determining appropriate postseondary placement options and assessing students' progress toward achieving success in their vocational goals.

Stage IV involves postsecondary activities. Student progress toward successful completion of their postsecondary option is monitored and appropriate assistance and support is provided.

This brief overview of the model demonstrates the interagency aspect of the transition programming problem. Project staff provide case management services during the course of the project, but the problem of determining agency responsibility remains a a difficult one. In the Project PERT model, vocational education, special education and rehabilitation share the responsibility for the overall program of each student.

The four-stage model evolved from the original grant through an interdisciplinary team. This model made available to participants various services based on the individual needs of the students. Students were eligible to receive services from the Woodrow Wilson Rehabilitation Center at no cost to the local school division. These services included a comprehensive vocational evaluation, a program to develop independent living skills, work adjustment or trial training, assistance with case management from both the project staff at WWRC and the local Department of Rehabilitative Services field counselors. The services specified above are made available as a summer program at WWRC and are provided in conjunction with, and as an extension of, the secondary vocational education programs which are offered in the local school divisions during the regular school year.

Project PERT is demonstrating strategies for joint planning and service delivery between and among professionals from the disciplines of special education, vocational education and rehabilitation. These strategies have been specifically designed to expand or extend the career ladders of mildly mentally retarded and learning disabled youth and young adults.

The cooperative development of these strategies has been an important component of Project PERT. The project staff represents knowledgeable in the areas of vocational education, special education, community rehabilitation services and vocational evaluation. The MIT members represent other resources at the local level for input into the development of the model and implementation of the strategies.

Professionals that provide services in vocational education, special education needs and local rehabilitation were asked what their concerns were in working together cooperatively. The concerns that were presented questioned the responsibilities of each discipline to the team, the time commitment to the transition process and the ability of the process to be modified to meet the demands within each local school division and rehabilitation field office.

The MIT members stressed the need for the model to reflect the integration of the important elements of each of the separate systems. An example would be the Individualized Education Program (IEP) process and the Individualized Written Rehabilitation Plan (IWRP) process. It was stressed that any procedures developed must take into consideration the needs of all systems.

The MIT members offered information specific to the initial evaluation, the time frame involved (summer), the nature of the recommendations that would be generated from this evaluation, the possible duplication of services if the school system already had an evaluation program, and concern as to who makes the final decision on recommendations. There was also concern that the evaluation and other service reports be consistent with the interdisciplinary decision-making process that exists in education. Evaluation reporting formats were critical in the development of the vocational component of the IEP/IWRP. It was stressed that the product must be useful and in-tune with the school systems' decision-making mechanism and entitlement issues.

After touring the vocational evaluation unit and understanding its procedures. The MIT members were convinced that the locally developed work samples, the vocational exploration capacity and the opportunity for trials in vocational education classrooms, career exploration and the vocational counseling services available to students during the two-week Project PERT evaluation were appropriate for the students. They also stated that the additional components of an independent living skills evaluation and a leisure skills evaluation were important to the process. They stressed that all information gained could be utilized in the vocational planning process in the school system. The planning process would require information in appropriate vocational areas, student abilities and compentencies, remediation needs relating to identified vocational areas, and behavioral data. The MIT member statements on the nature of the vocational evaluation service that was to be offered were consistent with survey reports of similar professionals in Texas, as noted by Peterson (1981).

A vocational evaluation can provide important information when planning the

vocational component of the IEP. Poplin (1981) recommends that all students who are going into vocational education classrooms be provided with vocational evluations. Information to be gained from the vocational evaluation includes: (1) observational data that provides information on the pre-vocational needs of a student in the area of work habits; (2) information on life skills training needs; (3) teaching techniques and curriculum modifications that would be related to individual learning styles and to the structure of a class or shop setting; (4) the best potential placement for a student at the end of his vocational training; and, (5) vocational strengths and weaknesses.

In light of these concerns, it became apparent that the initial evaluation, which consisted of the vocational assessment, independent living skills assessment, and leisure skills assessment, was one of the most critical components in the cooperative vocational planning process. With this in mind, the vocational evaluation process at WWRC was examined regarding (1) appropriateness for school populations; (2) usability of reporting formats for team decision-making and IEP/IWRP integration; and, (3) timeliness.

Developing the Vocational Assessment

Project PERT staff presented the concerns of the school-based personnel to representatives of the vocational evaluation component at WWRC. An examination of the vocational evaluation at WWRC revealed that strengths, relative to the school-aged student, were: (1) the ability to provide vocational exploration, utilizing locally developed work samples; (2) the ability to provide skills assessments, using commercially available work samples; (3) the ability to utilize the trial training mode when appropriate; and, (4) the ability to refer to work adjustment trials when determining appropriate behavioral techniques for remediation of work behaviors.

As in most rehabilitation evaluation settings, the evaluators were predicting the ability to be competitively employed before or after an immediate postsecondary training option. They were not looking at the developmental career perspective, as noted by Super (1983). Vocational evaluation staff also reported receiving feedback from the school systems that their reports were not always useful. However, they had not received information on report modifications necessary to meet the school systems' requirements.

Evaluation staff were interested in developing a procedure that would meet the needs of the clients as well as the referral sources. It was determined that some changes would be made in the existing process. Inservice training was arranged from a school-based vocational assessment unit. This training provided information to vocational evaluation staff on use of a competency-based evaluation that predicted the vocational training needs and a two-year planning process for the special education student. The training addressed the following: (1) reporting formats that could be integrated into vocational components of the IEP process; (2) information on interest inventories that were appropriate for the target populations; (3) the importance of the work sample procedures and hands-on vocational exploration experience; and, (4) the problem of utilizing appropriate norms when customizing work samples to meet individual student needs.

It was determined by the vocational evaluation staff at WWRC that to accomplish the vocational exploration goal and to have an emphasis on work samplings, the proposed two week time frame could be difficult. In the procedure, as it existed, the first two days in vocational evaluation are spent in an orientation program consisting of academic, aptitude and interest testing. This information is used to guide clients into appropriate work samples.

To maximize time spent in work sample evaluations, it was suggested that the Project PERT case managers provide an on-site assessment of students' skills using selected components of the General Aptitude Test Battery (GATB) and an interest inventory. This procedure allows for pre-planning of student vocational work sample assessment.

The Evaluation Process

It was decided that the evaluation process would proceed as outlined in the developmental stages. Data from school system records, GATB testing and interest inventories were used to schedule the work sample assignments prior to the students' arrival. An Individual Vocational Evaluation Plan (IVEP) was developed with each student.

Vocational strengths, weaknesses and interests were documented through performance and behavioral observations. During actual work sample administration, examples of process customization began to evolve. If interest or aptitude was noted in a particular area for which no work sample was available, job requirements were researched and a work sample developed. When determined as neccesary, the Virginia View System, part of the VOICC system, was used to emphasize career exploration.

Early in the evaluation process, a review of the procedures indicated a need for modifications. Some of these modifications suggested emphasis be placed on competency-based evaluations, predicting entry level vocational curriculum and potential for vocational development. To assist in these modifications, referral questions were designed to focus the evaluation on the specific needs of the school-based population. The referral questions asked were: (1) does the student have aptitude in the vocational area? (2) what is the student's current level of competency in the vocational area? (3) what projected level of competency could the student reach in this vocational area within the remaining

years of secondary education? (4) what remediation is necessary in trade-related academics to achieve the competency level indicated? (5) what remediation is necessary in pre-vocational areas to achieve the competency level indicated? (6) what modifications are necessary in vocational education courses to achieve the competency level indicated? and, (7) what is the student's best learning style?

Case Manager Summary Report

Data from the initial evaluations, including vocational assessment, independent living skills assessment and leisure skills assessment, was synthesized by the project case manager. The vocational evaluation report provided recommendations for training, job placement, pre-vocational and other needed support services. The recommendation format was modeled after that of a school-based assessment center and which was used by a school-based evaluation consultant. Recommendations were broken down into short, intermediate and long term goals and included recommendations for special education remediation that coincided with a given vocational area. In some cases, several vocational areas and their competencies were listed so that the student's parents and MIT members could make decisions as to the placement of the student into an appropriate curriculum.

However, this reporting format did not suit the needs of all the school systems involved in Project PERT. Problems noted were difficulty in accurately predicting what vocational classes would be offered in the school system and establishing a team decision-making mechanism within the system. In discussions with MIT members, it became apparent that a modification to the format would be helpful. MIT members suggested that a case manager's summary report format which listed functional descriptions of students' vocational strengths and weaknesses be adopted. This format would include student interests, abilities and aptitudes. In this manner, MIT members would determine the appropriate placement of the student and how the needed services would be provided. This format has been adopted in several areas and is currently being explored.

Expanding Career Goals

Results of the initial evaluation was provided to the MIT for planning of vocational programming with parents and students. Although some students may have had several vocational areas recommended during the evaluation, where possible, the choice was narrowed to one specific vocational goal. Figure 2. depicts the vocational goals and career interest areas resulting from the initial evaluations of students involved in the first year of the project.

During the initial evaluation of Project PERT participants, vocational goals were determined on the basis of student interests and skills demonstrated through local work samples. Twenty-nine of the forty-nine participants, or 59%, selected specific vocational goals. This was made possible through a specific clustering of interests and a clear demonstration of potential and competency in specific work-related areas. Seven participants, or 14%, were able to identify a career area as a general vocational goal. Career areas such as auto mechanics, business and marketing, and fashion merchandising were identified by interest and demonstrated ability. The remaining 13 students, or 27%, were were not able to identify a specific vocational goal nor an area of career interest. Academic and behavioral deficits made it impossible, at the time of the evaluation, to clearly identify vocational directions.

The MITs, in consultation with students and parents, were able to make placements in vocational classes in the local education agencies. For those students with specific and general career area goals, placement was a matter of simply scheduling the appropriate vocational class and supportive academic remedial instruction, in addition to any support services which might be appropriate. Placement for the 13 students with no specific goals was determined in a different manner. Although skills demonstrated and interests expressed were taken into consideration, the major consideration seems to have been behavioral concerns that required immediate attention. Placement in a vocational class included consideration of classroom environment (structure and distractions) and the skill level of the instructor in responding to the student's behavioral issues.

In the mid-year review, the MITs made referrals to the project for supplemental evaluation (trial training) in specific jobs for some students. This supplemental evaluation would explore the appropriateness of that type of training and, also, the extent to which students could develop their skills. This evaluation would be for two weeks and would be completed in the Training Department at WWRC. Some students, for example, have been referred for trial training in the areas of nurse's aide, auto mechanics/tune-up, carpenter's assistant, and welding.

As the appropriateness of these training areas is confirmed through trial training, the senior year in high school can be used for additional vocational training in that area. This will enable the students to develop technical skills needed to go beyond entry level placement.

Another type of referral made by the MIT includes postsecondary options for graduating seniors. The extension of career ladders is demonstrated by the referral to community colleges in curriculums leading to the development of careers in areas such as security, police work and electronics technician.

Early intervention, the development of a transition vocational plan and the provision of a continuum of appropriate vocational services has enabled Project PERT students to move toward the extension of career ladders in an appropriate

and expedient manner.

Figure 2. Project PERT recommended long-term vocational goals and career area goals, based on results of initial evaluations of 49 students during the first year of project operation. It should be noted that 13 students were not able to identify specific vocational goals, nor were they able to determine general career interest areas.

Project PERT
Recommended Long-Term Vocational Goals

Vocational Goal	No. of Students
Cook's Assistant	6
Nurse's Aide	5
Small Engine Mechanic	2
Nursery School Attendant	1
Baker's Assistant	1
Carpenter's Assistant	1
Commercial Cleaner	1
Consumer Electronics Technician	1
Sewing Machine Operator	1
Auto Mechanic - Parts Replacer	1
Tune-up Mechanic	1
Hospital Housekeeper	1
Chef	1
Cook	1
Child Care Attendant	1
Forestry Aide	1
Bicycle Mechanic	1
General Clerk	1
Electrician's Helper	1
TOTAL	29

Career Area Goals

Career Area	No. of Students
Auto Mechanics	3
Micrographics	1
Fashion Merchandising	1
Business-Marketing	1
Horticulture	1
TOTAL	7

Summary

A review of the literature, awareness of the impact of impact of legislation and discussion with educators indicates the need for provision of services to the handicapped and disadvantaged student. Project PERT was designed to aid in the development of strategies that could be utilized in the coordination of services offered by education and rehabilitation.

Implementation of cooperative agreements and development of program formats were initially utilized with six school divisions with diverse demographic and geographic identities.

The evaluation of these formats and provision of services resulted in response to the unique needs of the educational settings. The ability of Project PERT to succcssfully respond to existing needs was evidenced by the responce of school systems for inclusion as model implentation sites during Year II of the project. An additional vote of confidence has come from the Virginia Department of Education and Virginia Department of Rehabilitative Services in the form of supplemental funding for the second year. As a result of this commitment on the part of these two agencies, the project was able to establish MITs in twelve additional localities, rather than six, as was provided for in the federal grant. Consequently, Project PERT will serve eighteen localities this year.

The impact of the provision of coordinated services as a tool for the transition of youth from school to work has not yet been fully determined. However, reports from first year participants indicate an increased vocational education enrollment by the special education population and increased coordination of interagency services, which decreases service duplication and service gaps. Increased enrollment in postsecondary training and education opportunities has been noted. Additionally,there has been an increased awareness, in both education and rehabilitation, of the importance of beginning the transition of special education students early in their secondary school experience, in order to offer these students the best opportunity for a successful future as an adult worker.

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Author Notes

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Personnel Development of School-based Vocational Assessment Personnel

Michael Peterson, Ph.D.

Abstract

In recent years the implementation of and interest in vocational assessment of special needs students in school settings has increased dramatically, culminating in the passage of the Carl Perkins Vocational Education Act which requires that a vocational assessment be performed no later than the ninth grade for handicapped and disadvantaged students who enroll in vocational education. Vocational assessment in school settings is much like vocational assessment in any setting. However, a variety of characteristics of vocational assessment in schools require a modified model of vocational assessment and consequent changes in the skills needed by vocational assessment personnel.

This article summarizes: (1) a model for the implementation of vocational assessment services in school settings developed out of a four-year national project, (2) identification of personnel involved in vocational assessment who may implement this model (including teachers, counselors, school psychologists, curriculum-based vocational assessment coordinators, and vocational evaluation specialists), (3) discussion of skills needed by such individuals to implement the model, (4) and discussion of practical implications for vocational assessment education including funding, interdepartmental cooperation at universities, and relations with state departments of education.

Introduction

In recent years vocational assessment of handicapped students has been seen as increasingly important; consequently use of vocational assessment in secondary schools has been steadily growing and trends indicate that it will continue to do so, particularly with the passage of the Carl Perkins Vocational Education Act. This is creating an ever-increasing need to provide training for those involved in vocational assessment of special students in school settings. This article discusses issues relevant to personnel development related to school-based vocational assessment.

Organizational Model of Vocational Assessment

Two basic organizational approaches for vocational assessment in schools are seen in the literature: (a) curriculum-based vocational assessment, (b) vocational evaluation centers. This paper suggests using a combination of the two approaches above to draw on the strength of each and provide an on-going, developmental assessment of process. The approach is graphically illustrated in Figure 1 and is discussed below.

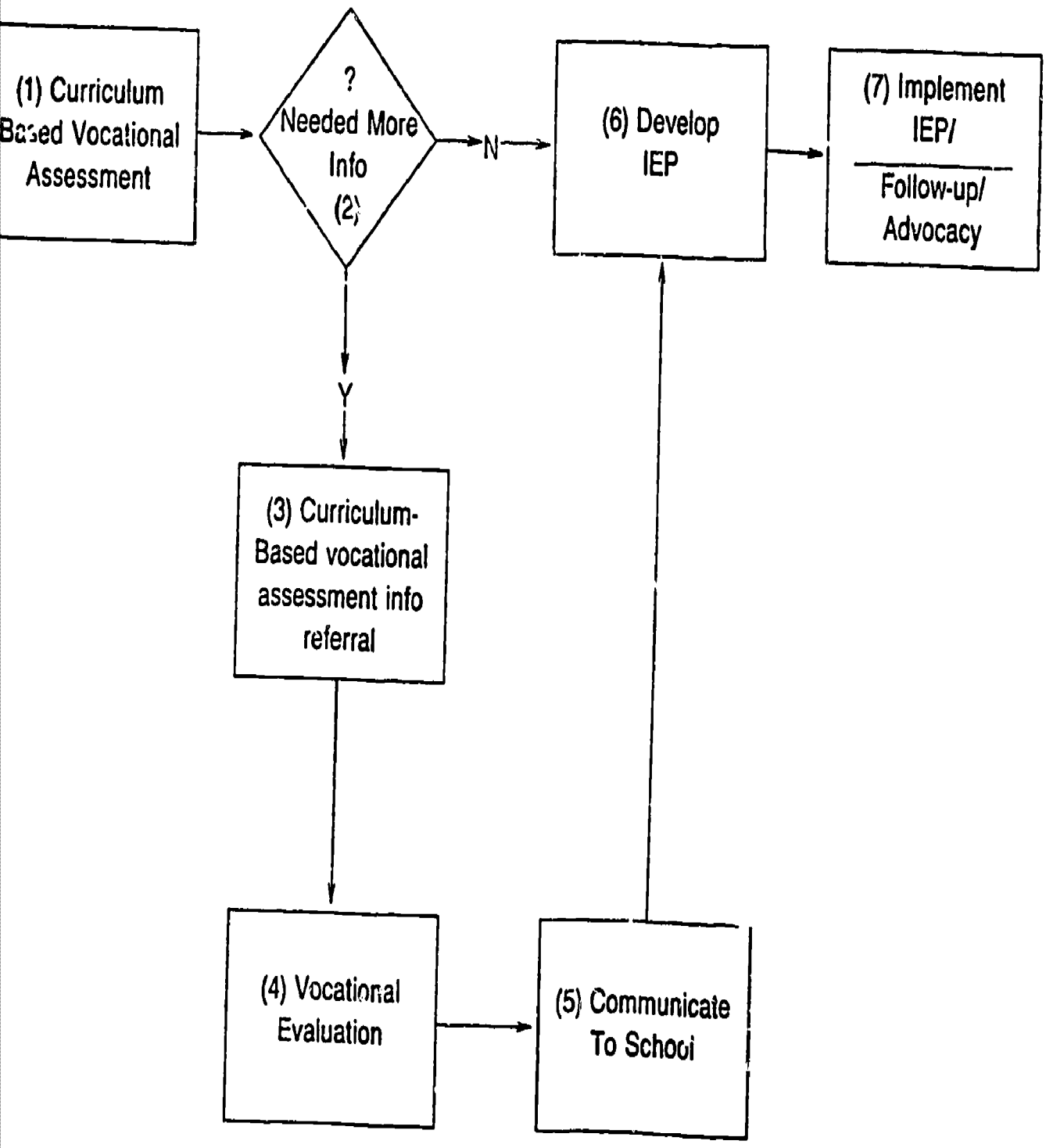
1. Curriculum-based vocational assessment should start in elementary school grades and be interactive with instruction. Information gathered during these years should guide development of individualized education plans relative to career orientation and exploration, prevocational skills, work behaviors, and functional living skills.

Curriculum-based vocational assessment refers to the use of existing school resources to obtain vocational assessment data about students. Such an approach has been advocated by an increasing number of writers as being a cost-effective method for obtaining vocationally relevant data from the regular school environment in a way that maximizes its likely impact on instruction and curriculum. Curriculum-based vocational assessment is usually considered to begin no later than late elementary school and to continue through the student's public school career. During the vocational and career development of the student, information is gathered at the various stages of orientation, exploration, and preparation. It is used to develop educational plans that facilitate career education and vocational development.

2. At major vocational decision points, such as the year prior to potential entrance into vocational education, the interdisciplinary team decides if more information is needed. If so, additional vocational assessment is scheduled which may include referral to a Vocational Evaluation Center. More information should be sought if information is not adequate to inform the vocational teacher on how to work with a student, if it is unclear that a student has the ability to succeed in a vocational program, or if teachers or parents feel that vocational assessment infor-

FIGURE 1

COMPREHENSIVE, DEVELOPMENTAL APPROACH TO SCHOOL-BASED VOCATIONAL ASSESSMENT



mation available does not adequately reflect the real abilities of the student.

3. If more information is needed a referral to a Vocational Evaluation Center is made. The "Curriculum-based Vocational Assessment Specialist" will then compile vocational assessment data gathered to date. This helps Vocational Evaluation Specialists to not duplicate information already gathered and to focus in on what yet needs to be done. A referral should also specify what type of information is needed and what vocational assessment questions must be answered. A case coordinator, usually a teacher or counselor, should be available to verbally clarify referral information and assessment questions.

4. A vocational evaluation is implemented that is based on the needs of the student. Using a center should include visits to vocational classes, interviews with teachers, and vocational classroom tryouts when laboratory classes are considered or job tryouts for cooperative vocational education programs. Such centers may be based in schools, rehabilitation facilities or other organizations.

5. Active methods are used to communicate vocational assessment information to instructional personnel so that educational plans and individual classroom plans may be based on this information. Minimally, a comprehensive report must be developed that is available to all who work with a student. Additional mechanisms have also been halpful. These include: (1) interdisciplinary team meetings following vocational evaluation, (2) development of summary reports sent to teachers and parents outlining results and implications and (3) use of liason vocational assessment counselors who help interpret vocational assessment results in meetings at a student's home school.

6. Advocacy and Consultation. Vocational assessment personnel should follow-up on recommendations made in vocational assessment, advocate for student involvement in vocational education and provision of appropriate support services, and give needed consultation and vocational teachers, special education teachers, and other educators.

Personnel in Vocational Assessment

Trained staff must be available to implement and use vocational assessment results. Personnel functions include: (1) vocational assessment team members; (2) a curriculum-based vocational assessment coordinator; and (3) a vocational evaluation specialist. These functions are discussed briefly below.

Vocational assessment team members. A variety of persons should provide input into vocational assessment. Multiple observations of students in various situations have been shown to increase validity of assessment results. Team members may include: teachers, parents, coaches, physical education teachers, special and vocational education teachers, counselors, rehabilitation counselors, etc. These team members must be given guidance in how to provide effective input into the vocational assessment process and effectively use vocational assessment results.

Curriculum-based vocational assessment coordinator. Some individual must be assigned the responsibility for coordinating curriculum-based vocational assessment. This function does not necessarily require a full-time position but may well be part of the job description of a special education teacher, counselor, school psychologist, or a vocational evaluation specialist. One individual initially must be responsible for coordinating the design of the overall curriculum-based vocational assessment process and training team members in its use. This responsibility includes: analysis of vocational skills in the school curriculum and requirements of jobs and vocational programs; selection and development of checklists, skill assessment forms, performance samples, and other assessment tools; development of a simple synthesis and reporting format; training staff to use assessment methods and efficiently record observations; and training staff to use information to develop career and vocational education instructional plans to students. This individual must be especially skilled in vocational assessment. Vocational counselors or school psychologists who have had training in vocational assessment or a vocational evaluation specialists may fill this function. A trained vocational evaluation specialist, however, should always be consulted in the development of the program. Once the process is developed, a variety of individuals might be designated to collect and coordinate this process for a particular group of students. For instance, a Chapter I or special education teacher could assist in collecting information on the students with whom they work.

Vocational evaluation specialist. Full-time vocational evaluation specialists must be available to work in Vocational Evaluation Centers as described above. Vocational evaluation specialists and curriculum-based coordinators have some overlapping functions. Vocational evaluation specialists must be especially knowledgeable concerning requirements of vocational education programs, other vocational training programs, and local jobs. They will interpret curriculum-based vocational assessment, develop individualized vocational evaluation plans, administer, score, and interpret results of vocational assessment instruments especially psychological tests, work samples, vocational classroom and job tryouts, and other methods that utilize work, real or simulated as the focal point of assessment. Vocational evaluation specialists should be highly trained in vocational assessment techniques via graduate education.

Certification/Licensure of Vocational Assessment Personnel

State licensure/certification of vocational evaluation specialists is problematic in many states. In too many cases certification is tied to existing standards for positions with requirements minimally related to skills needed by vocational evaluation specialists. This problem must be solved if students are to be provided effective services. Presently, many skilled evaluators cannot be hired by schools because of such problems

while individuals who fit certification requirements in unrelated areas fill such positions.

What is needed are hiring and certification standards that are built around the actual requirements of the job that allow hiring of those with the most skills and encourage skill improvement by those who enter this field with little training. The Certification Commission for Work Adjustment and Vocational Evaluation Specialists (CCWAVES) has developed standards for vocational evaluation specialists. This is a professional certification rather than a licensure procedure. However, requiring vocational evaluators to be certified will assure that at least minimal standards of education and training are met. These standards may also be used as a basis for developing local hiring and state certification standards.

Competencies of School-based Vocational Assessment Personnel

While many knowledges and skills of vocational assessment personnel in school and rehabilitation settings are common, it would appear that important differences exist as well. These are particularly related to the following factors: (1) curriculum-based vocational assessment as a longitudinal assessment process is not used in rehabilitation facilities; (2) persons at earlier ages and developmental levels are involved; (3) vocational education and special education have unique structures that are different from rehabilitation agencies.

Competencies that appear to be important include:

*policies and procedures of vocational education and special education

*functional limitations of disability

*occupational information and career exploration and counseling techniques

*career development processes

*job/vocational training analysis

*interviewing and counseling skills

*learning style assessment techniques

*individualized vocational assessment planning procedures

*psychometric testing that includes vocational aptitude, interest, career awareness, and dexterity assessment

*work sample selection and use that includes commercial work samples and locally developed work samples

*design and coordination of informal vocational assessment techniques

*situational assessment including behavioral observation in controlled work settings, vocational classroom tryouts, and on-the-job tryouts

*interpretation and report writing which includes development of recommendations for instructional and support service personnel

*assessment of job related functional living skills - transportation, etc.

*environmental adaptation and vocational curriculum modification

Personnel Development in Vocational Assessment

Training is needed both for (1) Vocational Evaluation Specialists and for (2) members of the vocational assessment team. Both graduate training and in-service is needed.

Universities should provide the primary training for vocational assessment specialists. Such training should be developed cooperatively between university departments of counselor education (rehabilitation), vocational education, and special education provided by personnel who are themselves qualified in the vocational assessment of special needs students. Interdisciplinary degrees should be developed, and additional course work should be available for persons currently having teacher certification who wish to function as Vocational Evaluation Specialists. Courses should be available for counselors, special education teachers, etc., so that team members develop some awareness of vocational evaluation in their pre-service programs. In-service should be offered on a continuing basis for both specialists and team members. In-service, initially, will be the most effective mode of training team members in local schools.

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ASSESSING THE VOCATIONAL ADAPTIVITY OF HIGH SCHOOL STUDENTS WITH MILD COGNITIVE AND INTELLECTUAL DEFICITS

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Abstract

The purpose of this paper is to discuss vocational preparation needs of high school students with mild cognitive and intellectual deficits, provide a general overview of how Project ADAPT, a program funded by the U.S. Department of Education is addressing these needs, and to specifically detail the steps and procedures involved in the assessment phase of this project. Much of the information presented in this paper is based on experience in implementing a three phase model program in five Wisconsin cities. Project ADAPT, is being conducted by the Research and Training Center of the University of Wisconsin-Stout.

Background Information

An abundance of literature suggests that significant difficulties are encountered by students with disabling conditions who are attempting to enter the labor market. The United States Department of Education (Bell, 1983) estimated that of the approximately 625,000 handicapped youth who leave the country's school systems annually, have some type of disability. It has been well documented in the research literature that these students have unemployment problems that surpass those of their nondisabled peers. Bowe (1980) suggests that the unemployment rate for this population is in excess of 50%. Gill (1984) presented data which supported this assumption. Another study by Mithaug and Horiuchi (1983) found that only 31% of the students surveyed after graduation were unemployed, but 43% of those who were employed earned less than $3.00 per hour.

Some other interesting facts regarding this population are that:

1. Only 10% of the students with disabilities are served by the state/federal VR system (Will, 1984).
2. Only 30% of school age youth with disabilities receive employment related instruction (Hippolitus, 1982).
3. Vocational rehabilitation (VR) is not an entitlement program, therefore some, especially those with mild disabilities, may not be served.
4. Teachers are frequently not acquainted with post school program options (Edgar, Horton & Maddox, 1984), thus are unprepared to suggest employment options to graduating seniors.
5. Many of the students with mild disabilities experience the same employment difficulties as their more severely disabled peers (Thomas, 1985).

In light of these observations, it is clear that programs for the assessment of the special education student's readiness to enter the working world should be a charge of the schools. Since a small percentage of students are served by the state-federal VR system, VR should be viewed as a resource to the school, rather than as the chief party responsible for this process. Employment Readiness Training (or job seeking skills as it is sometimes called) should be an integral part of the curriculum for students who are likely to benefit from this instruction, especially those who must conduct their own job search following graduation. Finally, teachers must be provided with the resources, the time, and training necessary to initiate and maintain an employment preparation program for students with disabilities well in advance of their anticipated graduation.

A common erroneous assumption regarding students with disabilities is that the have significant intellectual deficits, obvious physical impairments, or severe emotional problems. The fact is, a majority of these students present with

difficulties which may be considered as mild intellectual and cognitive deficits. This population is comprised of students who may have a specific learning disability (SLD), function in the mild range of mental retardation (EMR), or have some type of attention deficit disorder (ADD) which may characterize them as being emotionally disturbed or behaviorally noncompliant (ED). The majority of the students with disabilities described in the previously mentioned studies include individuals with mild disabilities (Bowe, 1980; Mithaug and Horiuchi, 1983; Gill, 1984).

Students with mild intellectual and cognitive deficits, tend to exhibit similar problems related to employment, educational and related issues, that impact on their work potential. These issues include the following:

1. Significant academic difficulties frequently exist, which in turn necessitates special treatment and therefore the stigma of being in special classes.
2. Social/interpersonal awkwardness is exhibited, due to certain intellectual and other cognitive deficits which tend to interact with the emotional related issues associated with being somehow different from other students.
3. Because students and their families see themselves as more "normal" than not, they tend not to seek out special employment services after leaving school.
4. For students who do need special employment assistance, they may be ineligible for services, since their disabilities may appear minimal.
5. Work histories tend to be limited or non-existent.
6. Relatively poor skills in searching for jobs and participating in interviews is exhibited.
7. For those who do obtain employment, one of the main reasons for termination, is that poor social-adaptive behaviors are displayed.
8. If early patterns of unemployment are encountered, the possibility of breaking that pattern becomes increasingly difficult, due to problems of learned helplessness and habitual unemployment.

Reviewing this list of characteristics points out the negative factors which are influencing the unemployment statistics reflected upon earlier. It is also interesting to note that there are many positive aspects in support of specialized vocationally oriented school programs for these students, which tend to minimize the employment related difficulties. For example:

1. Early work experiences tend to optimize the chance for lifelong employment patterns.
2. Many of the vocationally maladaptive patterns exhibited by these students can be eliminated or minimized by early identification and intervention while still in school.
3. Many vocationally adaptive behaviors can be enhanced and developed by work and life experiences, and if given the opportunity, many of these current LD, ADD, and EMR students can lead normal work lives and be absorbed without stigma into the competitive workforce.
4. Classes in job seeking skills will significantly increase not only the student's ability to locate and be hired for work, but will also enhance their ability to keep a job if hired.
5. Effective job search strategies learned in a job seeking skills class can be fostered and improved through a teacher assisted, structured job search which applies the skills learned in the class.
6. For students not capable of immediate competitive employment, involvement in public sector work experience programs such as those sponsored by a Job Training Partnership Agency, Youth Experience Program or a supported employment project will provide valuable work references and experience, and will foster the development of good work skills.
7. For students with more intense vocational needs, the types of training and graduated work experiences available in rehabilitation facilities can assist in adjusting the person to work and harden the skills necessary for independent competitive employment.
8. Finally, all of these efforts can be initiated while the student is still in school, and they can be incorporated as an integral part of the special education curriculum.

Definition of Terms

Vocational adaptivity, for the purpose of this article, will be defined as the ability of the student to adapt to the demands of the working world. This includes being able to:

1. Identify realistic goals and delimiters. Job delimiters are defined as the limitations that the student imposes upon the types of job that he or she is willing to accept, such as distance that the student is willing to travel to work, the hours that they are willing to work, and the minimum acceptable income level.
2. Search for work, either independently or with the assistance of a reliable other. This job search entails systematically searching the community for employment, interviewing for jobs and providing adequate correspondence as necessary. The use of the telephone is an integral part of this process.
3. Maintain a job when hired by demonstrating adequate work skills and social adaptive behaviors.

Employment Readiness Assessment is defined as the process of identifying the students' ability to function adequately in each of the three areas specified as components of vocational adaptivity.

Overview of the Components of Project ADAPT

Project ADAPT is comprised of three separate program elements. These elements include the Employment Readiness Assessment, Employment Readiness Training, and a Structured Job Search.

Employment Readiness Assessment is a process used to examine the students' ability to gain and maintain a job in the competitive labor market. The students' strengths and weaknesses are assessed in terms of ability to make vocational decisions, exhibit adequate job search and interviewing skills, display acceptable work related skills in the targeted area of employment, and to demonstrate appropriate interpersonal behaviors.

Employment Readiness Training, the second component of Project ADAPT, is designed to increase the students' ability to gain and maintain

employment by teaching effective job search methods, interviewing skills, telephone search skills, and job keeping behaviors. Deficit areas identified in phase one are specifically targeted for remediation in this phase.

The Structured Job Search component is composed of employment related activities near the end of the project. These activities involve the student in canvassing the community to identify prospective employers, and contacting employers to set up meeting times to review employment applications or participating in actual job interviews if possible. Practicing the skills that have been learned in the job seeking skills class is the critical element being reinforced during this phase. Even if the student's goals involve further education or training before looking for a job, the student is encouraged to search for employment, in order to complete a final assessment of job search strategies and skills.

The Process of Employment Readiness Assessment (ERA)

The first step in the ERA process involves a review of the student's cumulative educational file. This is done to document vocationally related information that currently exists. Functional skills in math, reading, readily observable work skills, potential problem areas, and potential work skills to develop through skill training are examined. Rather than providing standardized scores as descripters of academic or other abilities, a functional description of each is provided. For example, rather than stating that the student has a 6.5 math level, the teacher will specifically detail the skills that are available, and those that are deficit, to give a better understanding of a person's specific skills. Whenever possible, this is related to the student's targeted job goals.

A family interview is the next step in the ERA process. This meeting is arranged to encourage family members to participate in developing important vocationally related behaviors for the student and to solicit support for job tryouts, assistance in the job search process, and finalizing referrals to the state vocational rehabilitation agency (VR).

The Decision-Making Interview (DMI), a standardized interview procedure which assesses the student's ability to make employment related decisions, is the next step in the ERA. The DMI focuses on assessing the student's desire for work and ability to make an appropriate job choice; current job knowledge; and the readiness to make occupational choices on the basis of job knowledge. For students who are undecided about vocational goals and alternatives, occupational exploration is encouraged, and the assessment is interrupted until realistic, immediate, and long term goals are identified, with at least one alternative job goal in each of these two areas.

After realistic job goals are identified, the job seeking skills assessment is initiated. This begins by having the student identify a particular job in the community for which they would like to interview. The employment readiness assessment coordinator, generally the special education teacher, will ask the student to participate in a mock telephone interview, in which the student will attempt to acquire information about a company in general and the targeted job in specific. A number of critical telephone use skills are evaluated. Feedback on these issues are subsequently provided to the student. The use of an outline of topics to cover while on the telephone, and ability to clearly and efficiently state the reason for the call are examples of behaviors that are rated.

Next, the student is asked to participate in a mock job interview. Whenever possible, the interview is arranged so that the student will actually go to a business establishment for the interview. The teacher is asked to contact the employer prior to the interview to review the protocol to be followed and to explain the interview skills rating scale. Teachers are asked to role-play the interview with the student if an employer willing to conduct the interview is not found, or if a practice session is deemed necessary prior to the employer's interview.

Next, another interview is conducted by the teacher to examine the student's job search strategies. As with the mock job interview, this interview follows a standard procedure with each student. Methods of tracking job leads, scheduling interviews, arranging transportation to the job, etc. are some of the variables assessed.

Situational Assessments

Students in Project ADAPT participate in two types of situational assessments to examine their interpersonal skills, specific work related skills (e.g., timeliness, ability to perform tasks), as well as their ability to interact with supervisors, and receive criticism and work instructions. Since such a "work tryout" may be a new experience for some students, the first situational assessment is set up within the school. Generally the school based assessments are unpaid work tasks, which may involve an activity related to the student's vocational interest. This may include a placement in the school's office area, cafeteria, maintenance area, or possibly a special project within one of the vocational education areas. The nature of the task is not as important as the fact that the student is observed in a work setting. The main purpose of this assessment is to provide a school based assessment of the student's work related abilities in order to anticipate problems that may occur on a community-based situational assessment. Supervisor rating forms are filled out and feedback is given to the teacher and student regarding this part of the assessment.

A situational assessment in a community-based worksite is the final step in the ERA process. These situational assessment worksites are generally established in an area of the student's chief vocational interest, using whatever resources are available in the school and community to set up, carry out and pay for this assessment. In this part of the program, strong encouragement is given to pay a minimum wage for the hours worked in order to give the student an opportunity to earn a paycheck. It is recommended that this assessment last from 40-80 hours, with 40 hours being the minimum time desireable for observing work skills and providing a reliable estimate of the person's work adaptability.

Some of the sites involved in Project ADAPT use monies from the state VR agency, others use funds from other community resources to pay these wages. One school site used the local rehabilitation facility to set up the community-based work sites. The facility then provided a job coach and supervision as necessary, under the authorization of the state VR agency. Regardless of how the situational assessment is arranged, a supervisor's rating form is completed by the employer with the assistance of the ERA coordinator.

The Assessment Report and Staffing

At the conclusion of the ERA, a report is compiled by the ERA coordinator and a staffing with parents and community service agencies is arranged. The information collected during the three interviews (telephone, mock job interview and DMI), the school-based and community-based situational assessments, and information from the file review is presented in the report. On the basis of the findings documented in the report, the appropriateness of the student's goals are evaluated. A problem oriented plan is then developed, identifying the chief problems to overcome in order to achieve a successful transition to the targeted job goals. These problem areas are addressed in the remaining sections of the student's involvement with the project, and the report is periodically updated as problems to employment are eliminated, compensated for or worked around. Although not implied in the process, the student's goals for immediate living arrangements are frequently explored at this time as well.

When the job seeking skills and structured job search phases are completed, the student's performance in all areas is again assessed to determine progress. An update to the assessment report is then completed, so that a report of the student's specific employment readiness is on file if needed at a future date. The final step in the program is completed when linkages to all necessary community services identified in the problem oriented transition plan are made. Follow-up is encouraged throughout the summer, with a yearly follow-up for the following 3-5 years recommended. These yearly follow-up provide a data base of outcome statistics, and serve as an information and referral service for students needing further services.

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A VOCATIONAL SCREENING PROCESS FOR TRANSITIONAL PLANNING AT THE 9TH GRADE LEVEL

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Abstract

Delaware's Transition Project is sponsored jointly by the Division of Vocational Rehabilitation and the Department of Public Instruction under a federal grant. The purpose of the project is to develop a coordinated effort between home, school and community agencies, so as to allow for a smooth transition for special needs youth, from the school to the work environment. Transitional planning begins at the junior high school level with the development of vocational objectives, which are based on the outcomes of a comprehensive vocational screening procedure.

Throughout their educational experience, mildly to moderately handicapped students often face a variety of adverse problems and situations which require unique interventions. Unintentionally, youth do not always receive the necessary coordinated services which allow for smooth and effective transitions between programs. Gaps in communication among the student, family, school, community and state agencies may hinder the delivery of vital transitional services (Wircenski, Weatherford and Sullivan, 1985).

The Transition Project in the State of Delaware is a joint effort undertaken by the Division of Vocational Rehabilitation, the Department of Public Instruction, and local school districts, under a federal grant, to address concerns related to handicapped youth in transition. In order to facilitate communication, cooperation and delivery of services by special education, vocational education, vocational rehabilitation, and other agencies, it was necessary to pursue the development of a procedural model. The supposition underlying the primary model was that by coordinating the efforts of agencies and service providers, the handicapped student would experience a smoother transition from the educational to the working environment.

Twenty professionals, representing a wide range of state, local and private agencies, served as the Delaware Transition Project Advisory Council. The Transition Project staff was composed of a project coordinator, two vocational rehabilitation transition counselors, two transition counselors and one clerical support person.

During the 1984-85 school year, Core teams were established at five pilot sites, which represented a cross-section of the community environments found within Delaware and which served a population, representing the majority of handicapping conditions. The Core Teams were comprised of school staff members who were responsible for special education/vocational programs, the vocational rehabilitation transition counselor, and appropriate representatives from the Division of Vocational Rehabilitation and/or the Division of Mental Retardation.

The Core Teams were responsible for the development of a transitional model, or procedure, which would identify the functions and responsibilities of those involved in the coordination and provision of transitional services. Each of the five pilot sites was unique, based on the resources available locally and the level of disability served.

The Delaware model, a composite of the five pilot sites, was constructed so that implementation would take place in four procedural phases. In Phase I, a Core Transition Team is identified and established at each pilot site. This Core Team could include, but was not limited to, the school's IEP team, students, parents, vocational educators, and D.V.R./D.M.R. representatives and counselors.

Phase II implementation is undertaken by the Core Transition Team, at the secondary school entry level. Here, all special education students are reviewed, with emphasis placed on extant data which is relevant to vocational planning (i.e. interests, aptitudes, and behavioral observations). A major function of the team in this phase, is to determine, plan for, and implement additional assessments, which are needed to complete each student's profile. Prior to scheduling and course selection for the subsequent year, the Core Transition Team reviews the student profile and develops a comprehensive, long-range vocational plan, which extends through graduation or age 21. This plan includes areas of behavior modification, academic considerations, and specialized programming, which may impact on the student's potential for successful employment. This long-range plan becomes a part of the student's IEP and is the responsibility of the Case Manager.

Phase III implementation occurs during the middle secondary years, when the Case Manager reviews the vocational plan as part of the IEP annual review process. The Case Manager will refer the plan back to the Core Transition Team, if the plan is inappropriate or not working, or if available services are lacking. Necessary modifications are made, so that the revised plan will provide appropriate programming services.

The final phase of implementation, or "hand-off", occurs at the beginning of the last year in high school. At this time, the team reviews all seniors and determines what follow-up or referral services are appropriate. A transitional IEP meeting is conducted with referral agency representatives in attendance, as well as the student and parent. At this meeting, all available data are reviewed and the process of referral is determined. If additional, or updated information is needed, it will be identified and planning for the final year will be completed. The Case Manager and the agency/service representative share the responsibility for the "hand-off" year activities.

Once this procedural model was constructed, the Delaware Transition Project staff and the pilot site Core Teams were faced with a variety of decisions. On the functional level, concerns at the pilot school sites were focused toward three major issues: (1) selecting an appropriate screening device, (2) planning appropriate high school programs, and (3) encouraging student/parent involvement. Determining the type of comprehensive screening method to be used with the identified population was the major issue. The Transition Project supplied each School District Task Force with samples of six screening procedures available within the State. In Christina School District, the Task Force in conjunction with the school Core Team, chose KEVAS, an acronym for Key Education Vocational Assessment System. KEVAS was selected because it provided information which assisted the school in programming for the individual student, planning follow-up referrals and/or consideration of further assessment. KEVAS allowed each school district to evaluate the available vocational course offerings, in relation to the areas measured in the KEVAS subtests. KEVAS vocational recommendations were then made by matching the student's functional strengths and weaknesses to the vocational course profiles as defined by the district task analysis. The KEVAS screening results and recommendations were shared with the student and parent as part of the IEP process and were also reviewed with those special education and vocational teachers, who would be directly responsible for implementing the long-range vocational plan.

KEVAS is composed of a series of subtests, some of which are performed independently and some which are administered by trained examiners, using patented test equipment in a one-on-one setting (Penfield, Krass and Conlon, 1984). Administration of the system is flexible. Testing may be accomplished in one continuous 2-1/2 hr. group session, or subtests may be clustered and administered in smaller blocks of time. The KEVAS administration format has been found to be especially appropriate to the needs of the school environment, where scheduling, transportation, staffing and attendance coordination often demands flexibility. The format is also responsive to the needs of special populations, where attention is often limited and time on

task must be adjusted to accomodate this variable.

KEVAS integrates non-verbal, performance-based measures, which are portable and move easily from one test site to another. These measures have been found to be effective in assessing vocational potential, even among subjects with extremely limited reading and language skills (2nd and 3rd grade level). The equipment used within the system provides a "hands on" test experience, which is interesting and which motivates even the most unenthusiastic subjects. Included in the test program for 8th and 9th grade special needs youth are measures of: auditory acuity, auditory localization, auditory memory, visual acuity, color acuity, visual memory, hand strength, manual persistence, visual reaction time, auditory reaction time, combined visual/auditory reaction time, fine motor skills, problem-solving ability, abstract reasoning, basic language skills (including reading ability, word knowledge, reading comprehension and contextual language useage), arithmetic skills, expressed vocational interests, social competency, personality attributes and historical and demographic data.

Because KEVAS is a computer-based system, the assessment component can be used as a data management system to produce both individual results as well as group output. All test data are computer maintained and the group database is used to produce local norms, as well as descriptive statistics, on the population under study.

Group data analysis is used to identify areas of group need which may be remediated through instructional adaptation or addressed through appropriate program development or provision of support services. Analysis of data produced by a small pilot study conducted in Delaware with 9th grade special needs students, indicated that combined visual/auditory processing was the most effective group processing modality (Conlon, 1985). Based on this finding, the significance of integrating multi-modal instructional techniques and materials becomes apparent.

Presently, KEVAS is being used in Delaware as a state-wide vocational screening procedure for 8th and 9th grade special needs students. It is estimated that 850 students will be included in the sampling. Upon completion of testing in June 1986, a comprehensive analysis of the population will be undertaken so as to determine the functional patterns of the population and areas of need which can be addressed instructionally.

Thus far, school and community response to the Transition Project model has been very positive and enthusiastic. There now appears to be a means through which Delaware educators can interface with the extended community to provide necessary, in-depth, continual support services for special needs students.

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VOCATIONAL EVALUATION IN THE PUBLIC SCHOOLS - THE VIRGINIA MODEL

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ABSTRACT

Because Virginia's Standards of Quality for Public Schools require that all high school graduates possess a marketable vocational skill or be prepared academically for college, the need for vocational assessment services for handicapped and disadvantaged students was recognized. During the 1979-80 school year, the Virginia Department of Education made funds available for the development of a model for regional comprehensive vocational evaluation services for the handicapped. This model was developed over a three-year period. At the conclusion of this period, the State made money available for the development of additional regional vocational evaluation centers following the Tidewater model. This model provides a hands-on, four-day evaluation using commercially and locally developed work samples. Work sample systems used across the State, depending on job markets, are: VIEWS. JEVS, Singer, Choice, Valpar, Prep Coats, and Project Discovery. This model concludes the evaluation process by preparing a narrative report which identifies the student's performance assets and limitations, work behaviors, and remedial services needed, if any, before entry into a vocational program or job. To date, the State of Virginia has established twenty-two (22) comprehensive vocational evaluation centers and has a goal of making the service available to every handicapped and disadvantaged student in the State. The Department of Education is also working with the Department of Rehabilitation to establish cooperative agreements for evaluation services.

Background

Over the past decade, Virginia educators have increased their attention to developing a systematic process that would provide secondary special education and disadvantaged students an opportunity to explore job areas utilizing a hands-on approach and vocational interest assessment. Provided with this type of information, students can then be appropriately placed into vocational education programs with a higher rate of success. Successful completion of vocational training is a criteria of the Virginia Standards of Quality that each student must be prepared for either higher education or the world of work.

In a report to Congress on the implementation of P.L. 94-142, it was indicated that nationally only six percent of all individualized educational plans, IEPs, prepared contained information on vocational goals. This deficit in the State of Virginia is in the process of being curtailed by the use of regional or local vocational assessment centers strategically located throughout the state.

The 1981-82 school year was designated by the State Department of Education as a planning year for the establishment of a systematic way to implement vocational evaluation centers across the state. During that planning year, four objectives were developed. The first objective was to plan and conduct a statewide conference enabling school administrators and others an opportunity to learn about vocational evaluation in secondary schools. The second objective was to organize a statewide task force that would plan and coordinate the services between State agencies and departments. The third goal was to form a technical assistance meeting involving the State Department of Special Education and the already established SECEP Vocational Evaluation Center.* This meeting was to prepare for the implementation of two pilot programs during the 1982-83 school year. The final objective for that planning year was to distribute requests for proposals (RFPs) to local educational agencies and Planning Districts involved in the regional technical assistance meeting.

*SECEP (Southeastern Cooperative Educational Programs) was a pilot regional vocational evaluation program that was funded by Federal ESEA Title IV-C monies. The SECEP program was housed at Crestwood Jr. High School in Chesapeake, Virginia, and serviced communities in Norfolk, Isle of Wight, Suffolk, Portsmouth, and South Hampton County.

The 1981-82 planning year proved to be very successful. To date, a total of 14 regional vocational assessment centers serving 53 school divisions has been awarded grants totalling $612,502 and serving 2,975 students annually. In addition to the regional vocational assessment centers established through EHA Title VI-B funding, eight school-based vocational assessment programs serving 13 localities have been established using various local, state, and federal funding sources. At the present time, a total of 66 Virginia school divisions provides handicapped and disadvantaged students with comprehensive assessment services through 22 school-based evaluation centers.

A Plan for Expansion

It should be noted that Carl D. Perkins Vocational Education Act of 1984 requires that recipients of the "handicapped set-a-sides" provide vocational assessment services for handicapped students enrolled in vocational education. In addition, Virginia's Governor Gerald Baliles' "Agenda for Virginia's Schools, Colleges and Universities" highlighted the development of vocational assessment services for handicapped students in the public schools and established fiscal year 1986-87 as a target date for these services in the State. By 1988-89 the goal of the State is to have a network of regional vocational assessment services which are of high quality and equally available to all secondary level handicapped and disadvantaged students.

A Description of Services

Vocational assessment in Virginia has been developed as a two-phase process. The initial phase utilizes classroom centered techniques and existing student data to assist the handicapped student in selecting an appropriate vocational training option. The second phase of the vocational assessment process involves comprehensive vocational evaluation and uses assessment techniques such as work samples, vocational interest and aptitude tests, and behavioral observations in a controlled work setting.

Establishment of a Comprehensive Vocational Evaluation Center

Each center in the State has adopted CARF (Commission for Accreditation of Rehabilitation Facilities) vocational evaluation standards for the establishment of their centers. Schools are not rehabilitative facilities and have chosen not to be CARF accreditated but have used CARF guidelines to ensure quality and consistent services across the State. Each center has become unique in its own right due to the variety of job opportunities available in each locality.

General guidelines and procedures for establishing centers recommend that a survey be conducted to determine the job and training opportunities for that locality. Once the survey has been completed, the program coordinator or vocational evaluator is then prepared to select relevant work sample equipment to meet the unique needs of the area.

In conjunction with the survey of training opportunities, a communication network between the evaluation center staff and school division personnel is imperative. Most centers request that the school superintendent from each school division designate one person to serve as a contact person. It is the responsibility of the contact person to coordinate referral information between each school and the evaluation center, to arrange transportation, and to disseminate vocational evaluation reports to appropriate personnel.

The Virginia Model of Comprehensive Vocational Evaluation

The Peninsula Area Cooperative Educational Services (PACES) Vocational Evaluation Center has adopted the Virginia State Model for Comprehensive Vocational Evaluations and will be used as an example of the evaluation process used in the State of Virginia.

The PACES vocational evaluation lasts two to four days and is dependent upon each student's individual needs. When the students arrive for their evaluations, they receive an orientation to the evaluation center which includes an explanation, an overview of the shop rules, and a tour of the center. Also, during this time the students are given a vocational interest test.

Upon completion of the orientation, each evaluator conducts an initial interview with his/her students on an individual basis. This allows the evaluator to establish rapport with each student and determine vocational interests. The students are encouraged to pick at least four occupational areas to explore while at the evaluation center. At the conclusion of the initial interview, the Individual Written Vocational Evaluation Plan, IWVEP, (Figure I) is developed. The IWVEP is composed of specific evaluation questions to be answered through the vocational evaluation process. For example, what are the students' achievement levels, tested interests, work behaviors, and job-seeking and keeping abilities? The students' four (or more) stated interests are also considered: Does the student have the abilities needed to become a welder, carpenter, electrician, etc.? Each vocational area is then divided into critical factors which include the individual aptitudes and work skills required for a particular occupation. Examples of critical factors assessed include the following: eye-hand coordination, finger dexterity, work speed, and bimanual coordination. The final step in developing the IWVEP is to determine the appropriate evaluation technique needed to assess the individual critical factors. Upon completion of the IWVEP, the student begins the hands-on portion of the evaluation.

The PACES Vocational Evaluation Center uses a variety of assessment techniques to complete the comprehensive evaluation process. Several types of work sample systems are used including Valpar, Views, Singer, Choice, and locally developed work samples. Currently, PACES has over 27 vocational areas for students to explore.

The work samples provide a realistic, hands-on experience for the student and an assessment of critical factors essential for success within a given occupational area.

While students are at the evaluation center, the evaluators continually record behavioral and performance observations. The Work Behavior Assessment is a critical factor in the evaluation process because it has become clear that the majority of students who fail vocational training programs do so because of inappropriate work behaviors and not because of lack of sufficient work skills. At the end of the week, the evaluator completes a Work Behavior Rating Form which allows he/she to note both positive and negative work-related behaviors that may have an affect on the student's ability to maintain competitive employment.

In addition to observational data, vocational counseling and feedback sessions occur to assist the student in better understanding his/her abilities and to provide additional employment and training information. At the conclusion of the evaluation, the evaluator, once again, sits down with the student to conduct an exit interview where they extensively discuss work behaviors, work performance, job interest, and training programs. The exit interview formulates the beginning of the final report and ensures that the student has an understanding, to the best of his/her ability, of what will be included in the vocational evaluation report.

Vocational Evaluation Report

The outcome of the PACES Vocational Evaluation is a comprehensive Vocational Evaluation Report. The report consists of four sections including 1) Referral Information and General Description, 2) Work Performance, 3) Work Behavior, and 4) Recommendations - Short and Long Term.

Section I of the evaluation report provides information concerning the referral source and an explanation of why the student was referred for a vocational evaluation. The first section also provides an overview of the student, initial impressions, pertinent medical information, and a summary of the student's work history.

Section II summarizes the student's work skills and interests during the evaluation. Significant positive factors in work performance are noted, as well as limitations that may affect the student's ability to succeed within a vocational training program or maintain competitive employment. Also included in this section are the results of standardized achievement testing, interest testing, and the student's stated interests during the initial and exit interviews. Preceding the conclusion of the Performance section are summary statements concerning results of the student's physical capacities and job seeking/keeping abilities. Section II concludes with a statement summarizing occupational areas in which the student has stated interest and has demonstrated potential for success.

Section III of the report summarizes positive work-related behaviors observed throughout the evaluation. Behaviors that may limit the student's ability to obtain and keep a job are also documented along with a brief description of the context in which the behaviors occurred.

Section IV (Recommendations) becomes the outline for the student's future vocational programming. The recommendation section is divided into short and long-term vocational goals. The short-term recommendation section first identifies remedial services needed prior to entry into a vocational training program such as work adjustment, academic trade related classes, job-seeking training, or other services. Secondly, specific vocational training programs or placement opportunities are given. Alternatives are also provided in the event that a program is unavailable or interests change. The long-term recommendation section identifies first of all the level of employability expected and then specific examples of jobs with DOT (Dictionary of Occupational Titles) numbers.

Implementation of Report Recommendation by School Division

The final report is returned to the contact person who is responsible for disseminating the report to appropriate personnel that includes special education teachers, vocational teachers, guidance counselors, and school psychologists. The evaluators are available for consultation and staffing regarding the final report and training placement.

Follow-Up

The PACES evaluation center is currently in the process of developing a systematic process to follow students, once they have completed an evaluation, through vocational training and into job placement. A total of 56 students (28 disadvantaged and 28 special needs) evaluated by PACES were placed into the New Horizons Technical Center - North Campus during the 1985-86 school year. At the completion of the first semester, a remarkable 85% of those students who were recommended by PACES for direct placement into a specific vocational training program were passing with a "C" or better grade average. The 15% who were unsuccessful received a "D" or "F" at the end of the first semester and were identified by their instructors as having the ability to succeed in the class but having chronic absentee problems. Fifteen students were placed at the New Horizons Technical Center; even though, they had been identified as needing work adjustment or remedial services. Because formal work adjustment, at present, is unavailable within the schools served by PACES, these students were placed into vocational training programs identified by the evaluation as interest and ability potential contingent upon completion of remedial and/or work adjustment programs. At the end of the first semester 100% of these students had failed or dropped out of the vocational technical center. These preliminary studies clearly indicate the potential of vocational evaluation for identification of vocational skills, work behaviors, remedial services, work adjustment training, vocational training programs, and job placement.

PACES currently is seeking monies to develop and implement a model program for work adjustment in the State of Virginia.

Figure I. Individual Written Vocational Evaluation Plan

HYPOTHESIS	CRITICAL FACTOR	PROCEDURE
1. What are achievement levels?	Spelling Arithmetic Reading	WRAT
2. What are tested interests?		CASE Vocational & Inventory
3. What are work behaviors?	HCE IH A St RUMT WM OIB CS P R SP RSA OTH VWE FT S T SS RA CSA PC D SR RCP	WBRF
4. What are job seeking and keeping skills?		JS/JK Job Application
5.		
6.		
7.		
8.		

Student Signature_____ Date_____

Evaluator_____ Date_____

Disposition/Rec._____ Date_____

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THE IMPACT OF THE CARL D. PERKINS ACT ON VOCATIONAL ASSESSMENT: HOW WE CAN MEET THE MANDATE

PAMELA J. LECONTE

Abstract

The Perkins assessment assurance has created an accelerated interest in vocational evaluation and assessment. Interpretation of this assurance and subsequent implementation activities will have far-reaching implications on the vocational evaluation profession. Expansion of vocational assessment services and development of different methods and strategies for reaching a larger number of handicapped and disadvantaged individuals are needed while not foresaking the integrity of assessment.

Vocational assessment and evaluation have experienced a gradual but continuous development. The field has been effected by the emergence of variations in this process-oriented service as they have been applied to a variety of settings. Historically, vocational evaluation has been identified with vocational rehabilitation. Literature documents that vocational assessment has emerged in other human service delivery systems, such as school settings and manpower programs (Peterson, 1985), thus creating other, though shorter, histories. Whenever vocational assessment is described and utilized in a process format as opposed to a fragmented, hit-or-miss series of screening or category testing (e.g. specific aptitude testing for entry into a job or training program), the profession is profoundly effected. If one scans the historical development of the profession, it becomes apparent that most changes precipitated by the use of vocational assessment in settings different from rehabilitation have resulted in improvements, expansions, and more clarity in the delivery process. Recently, however, confusion and controversy have accompanied most national "discussions" about the types of services which are most appropriate.

Equity and Quality

The most recent impetus for change and refinement represents a legislative mandate, The Carl D. Perkins Vocational Education Act of 1984. Thus far, this "impetus" has fostered an increased intensity in debates about appropriate and cost effective vocational assessment services. The content of these debates will not be addressed in this article. However, the fact that controversy and differences of opinion exist, should not be ignored. This author's view is that we must look upon the Perkins Act as a challenge to improve and upgrade our services and that current controversies will force us to refine the concepts inherent in vocational assessment and allow us to create better service delivery systems.

Many practitioners and advocates who serve individuals with disabilities or disadvantagements view the Perkins Act as an extension of earlier landmark civil rights statutes, such as the Education of all Handicapped Children Act of 1975, P.L. 94-142. Their appraisal is based on the frequent cross references to P.L. 94-142 and the inclusion of all populations into appropriate vocational education programs in a least restrictive environment.

Most knowledgeable advocates for appropriate and improved vocational preparation of special populations realize that equity begats quality, which, in turn, provides better and more equitable instruction and services for all

students. For example, by adapting lesson plans for a learning disabled individual who has weak auditory but strong visual or tactile learning preferences, others in the class with similar learning styles benefit from the changes.

Assessment in a Vocational Education Context

When analyzing the implications of the assessment component in the Perkins Act, one primary factor should be kept in mind. That is, when planning for and implementing the assessment assurance it must be viewed within the context of more global, vocational education. In other words, this is but one of several assurances which should lead to more equitable and effective vocational preparation of students. In order for handicapped and disadvantaged students to realize the full intent of the mandate -- that they should be afforded the same vocational opportunities which others enjoy -- the entire package of assurances must be met. Briefly, the other assurances involve equal access to

(1) the full range of programs
(2) all occupationally specific programs
(3) cooperative education
(4) apprenticeship programs

in the least restrictive environment with the support or supplemental services necessary for full participation and successful program completion.

Translated into practical terms, (1) "full range of programs" means that an individual who is interested in business/office occupations should have access to advanced data processing as well as to the more introductory typing course. Access is qualified, however, by the appropriateness of the match between program requirements (e.g. prerequisite and entry level skills, performance criteria and exit level competencies) and the abilities and interest of students. Thus, architects of the Perkins Act provide a rationale for requiring that handicapped and disadvantaged be provided "assessment."

Regarding (2) "all occupationally specific programs" means that handicapped and disadvantaged should not be limited to participation in traditional, stereotypical vocational courses, such as food services, masonry, maintenance or custodial work. Rather they should have access to electronics, computer sciences, licensed practical nursing and others which require higher levels of functioning. Again, a rationale for assessment is provided in that prescriptions of support will be needed to ensure that participation will be successful. Cooperative education, (3), alludes to an established and highly successful vocational education content area which frequently has not included many handicapped students, partly because special education often has parallel work experience programs for this population. This practice is viewed by many as a duplication of effort. Inclusion of special education students into "regular" cooperative education programs would provide expertise from personnel trained in the matters of community-business-industry partnerships for providing actual job experiences. Release of the special educators from work experience coordinating activities, for which they are usually not trained, would free them to provide support to students participating in the "regular" program -- and, for this they are trained.

Finally, (4) "apprenticeship programs" has been an underutilized educational option for many students who require supplemental services to achieve success. Apprenticeships allow students a "foot in the door" to continue training after formal schooling and the opportunity to train and work with master craftsmen, which will eventually enhance their life-long achievements.

Thus, when considering the nature of these assurances, the implications for assessment become more obvious in that the type of appraisal referred to and required is vocational in orientation. Assessment personnel must be intimately familiar with and knowledgeable of all vocational education programs and opportunities. Inherent in the familiarization process for vocational assessment personnel is the undersanding that frequent contacts will be made with vocational educators. Neubert (1985) found that vocational assessment services were utilized more effectively and placement recommendations were more frequently and successfully implemented due to the mutual trust and rapport that was nurtured between vocational instructors and vocational assessment personnel. Another inherent notion crystallizes the participation of vocational instructors in the assessment process by

- assisting with the development of work samples or situational assessments for their occupational areas;
- collecting assessment data via traditional instructional evaluation procedures as well as those collaboratively established with vocational assessment personnel;
- conducting "specific training assessments" or job/shop tryouts for students who may have an interest and potential in particular occupational areas.

Vocational assessment should generically incorporate the content areas in vocational education: health, agriculture, distributive and marketing education, business and office education, cooperative work experiences, home economics, trade and industry programs, and though it is not always included under vocational education, industrial arts. More specifically, vocational assessment should also be relevant to the training and employment opportunities unique to the school system and the community at large.

Assessment Assurance: What It Says and Does Not Say

For the intent of this assessment assurance to be realized to the maximum extent, anyone involved in planning, implementing, and accounting for the act should be knowledgeable about 1) what the actual statute states, 2) what guidelines federal policy-makers, in this case the U.S. Department of Education, has issued, 3) how state education agencies interpret it, 4) how local education agencies interpret, implement and evaluate it. Specifically, the assessment assurance states

> "each student who enrolls in vocational education programs and to whom subsection (b) applies" (subsection (b) lists eligibility factors for disadvantaged and handicapped students) "shall receive (1) assessment of the interests, abilities, and special needs of such student with respect to completing successfully the vocational education program:" (Title II, Part A, Section 204(c), P.L. 98-524).

It is noteworthy that the language "who enrolls in" makes it unclear as to who is guaranteed or eligible for assessment: is it those who may enroll in or those already placed in vocational education programs?

Power of Interpretation

A positive aspect of vague and nebulous legislative language, involves the empowerment of decision-makers and policy analysts to interpret mandates in ways that fall within their capability to implement them, allow maximum use of minimal resources, and still meet compliance expectations of the law. On the other hand, a negative aspect permits many who may not agree with the intent of the law to expend as few resources as possible to minimally or marginally be in compliance.

To date, the U.S. Office of Education has not issued formal guidelines for compliance. However, an informal, working draft of "minimum guidelines" for the first year of Perkins was disseminated to all state vocational education special needs administrators. These guidelines do not constitute official regulations. The draft specifies the following "minimum basic requirements"

- identification of occupational interests
  - expressed - via structured interview
  - testing - via interest survey
  - manifested - via observations by teachers using structured rating forms
- identification of abilities via test information and "hands-on" activities to include aptitudes, skills, special abilities, manipulative skills and dexterities.
- identification of learning styles via classroom observation via student-stated preference via learning style inventory.

Inherent within the assessment process are interpretations to the student, restatement of vocational opportunities, and opportunities for student to make vocational choices based on assessment information.

Though sketchy, the message from the federal level seems clear, that the rules for providing credible assessments in any situation also apply to vocational assessment. For example, a variety of techniques and instruments should be employed and a variety of individuals should conduct assessment activity, and feedback should be provided to the student, to name a few. It is critical to note that the use of expensive, commercial instruments or systems is not mentioned. This does not preclude the value and effective use of commercial tools, but there are no requirements to use them.

A phenomenon occurs when people are required to implement an assessment mandate, people often panic and are prone to search for, and ultimately use "the one instrument or system" which will answer all assessment questions, be appropriate for all populations, and fulfill the compliance obligations. Nothing is accomplished by using one tool or technique but people dupe themselves into believing that the one-stop assessment tool is worthwhile. By utilizing a variety of techniques, a combination of processes for assessment, and interspersing standardized or commercial instruments with locally developed ones, implementation is easier, elicits more accurate results, and can serve a greater number of students. Furthermore, the training and inclusion of various educational personnel in the assessment process, allows more individuals to receive a longer-term appraisal. Within the educational system guidance counselors, special education teachers, vocational educators, "regular" education teachers can all contribute to the assessment process. However, it is preferable if a professional trained in vocational assessment methodology or vocational evaluation trains, coordinates, and monitors vocational assessment activities.

Use of existing assessment programs should be incorporated into the process for individuals who require additional or different assessments. A number of local systems use private or public vocational rehabilitation, vocational evaluation programs and facilities rather than duplicating local services. Some states are interpreting the statute and guidelines in a conservative manner. Others are viewing these as an opportunity to utilize funds for targeted priorities. In both instances, handicapped and disadvantaged students will benefit. Before the benefits can be achieved, a long, time-consuming process must be worked through by professionals who are committed to long range positive outcomes.

The more conservative approach involves interpreting the eligible recipients for assessment, "student who enrolls in" as only those who are already enrolled in vocational education programs -- which can include pre-vocational or exploratory classes and which are not necessarily limited to specific skill training programs. If one follows the dictates of common sense, it seems more logical for students to be vocationally assessed prior to choosing and participating in a program (though not to the exclusion of on-going assessment following enrollment in a vocational program) . It seems assessment information would be more beneficial to vocational instructors if they have time to plan accommodations prior to a student experiencing frustration, embarassment or failure in the vocational classroom. In the short term, assessing from a limited pool of students may be more manageable and may save money, but in the long term is this approach cost effective when considering the time spent with students and instructors struggling for mutual success?

This approach, though a popular one, also seems to violate the intent of the equity and quality assurances in the vocational education act when it states "equal access will be provided to handicapped and disadvantaged individuals in recruitment, enrollment and placement activities."

One must ask what happens to the handicapped and disadvantaged students who, not enrolled in vocational education, may never gain entrance because they will not be assessed. Often, vocational assessment activities ignite a latent interest, provide enough confidence or improved self-esteem which motivates students to apply for vocational programs, or enlists those conducting vocational assessment as advocates for the students who, in turn, facilitate acceptance into appropriate, desired vocational programs (Neubert, 1985).

Further evidence seems to favor assessment prior to placement in programs when one considers the phrase "with respect to completing successfully the vocational education program." How can we maximize success if we are not apprised of a vocational profile based on assessment data which includes interest, abilities, and needs prior to enrollment in vocational education?

How To Meet the Mandate

The following outline does not present any new ideas, but it should provoke some thought among those individuals who are responsible for implementing the Perkins Act and should reinforce the notion that if practitioners with training and experience in vocational assessment or evaluation are available they should provide expert input and knowledgeable direction toward compliance. Again, when identifying needs and and resources planners should assess the community outside the school system in addition to those which are delineated and available within the system. Collaboration among "disciplines" will prove the most beneficial and cost effective in the long run.

Developing a Vocational Assessment Process

I Identify key personnel within
- o administration
- o vocational education
- o special education
- o guidance
- o support staff
- o vocational evaluators/assessment specialists
- o outside/community agencies

II Assess what exists -- what you have already (within and outside the school system)
- o what resources exist currently
- o when existing assessments are conducted
- o who assesses and who is assessed
- o when assessment takes place
- o how the information is used

III Assess needs and priorities -- what you want to have
- o what can be afforded
- o where funds will be expended: for personnel and/or instruments
- o what assessment aspects are most critical for the local system

IV Compare what you have with what "should be"
- o what is required
- o describe the ideal - optional services desired
- o decide what can be accomplished realistically
- o plan how to implement the process

V Implement plan
- o agree upon a process that will serve as a structure for all vocational assessment
- o define roles of key players (personnel)
- o assign and agree upon responsibilities for each role
- o ensure that all participants know the specific roles and responsibilities of each other

VI Establish time frames for each phase of implementation

VII Provide in-service training for all key players and others who are required to collect assessment information:
- o purpose and value of assessment
- o explanation of the process
- o their roles and responsibilities
- o "how to" collect vocational assessment data
- o recommended classroom based activities and use of curriculum-based assessment
- o "how to" interpret information
- o the components of a vocational profile
- o "how to" integrate assessment findings and recommendations into individual educational plans and vocational programs
- o referral criteria for further, more in-depth vocational assessment and evaluation

VIII Evaluate the process at predetermined checkpoints

IX Refine and alter the process based on program evaluation results

A factor which is often overlooked concerns the part or importance people play in implementing viable vocational assessment process. Attention also should be given to the populations to be served, their needs, abilities, potentials and how they will interact with vocational environments. Equally as critical, the professionals who are responsible for these students should be appraised regarding what they can/should do, who can or should be responsible for the various "pieces" of a total assessment process, and what training do they need to be successful. Without initial and on-going training and administrative support vocational assessment will not reap the benefits or outcomes which were intended. It is essential that an administrator be assigned responsibility for overseeing vocational assessment activities, only then will pre-assessment, actual assessment, and post-assessment activities be "bought into" by staff and effectively implemented.

Many discussions in our field have centered around instrumentation, models of vocational assessment, which type of assessment is best, etc. These issues should be addressed, but they should be dealt with by focusing on the people involved and the roles they can play. Taking time now to carefully plan a systematic process which can be integrated into the total educational system, will satisfy compliance monitors in the future.

In order to develop a truly collaborative, process that promotes integration into the career development and vocational preparation of handicapped and disadvantaged individuals, an interactive process must be ongoing among professionals. And, of course, good vocational

assessment encourages and relies on constant interaction between professionals and the students who are being assessed.

Essential Components of Vocational Assessment

Regardless of the format or model used -- curriculum-based vocational assessment, vocational evaluation center/unit, a combination of classroom-based assessment and formal, time-limited vocational evaluation, certain essential components must be included in the development of a vocational profile which can be used for career planning and subsequent vocational preparation.

These components, in general terms, are

- o background information (academic, medical, and physical, cultural, values),
- o learning styles, worker styles preferences (temperaments, environment),
- o worker characteristics (traits, employability skills, readiness),
- o work and social behaviors,
- o aptitudes,
- o interests,
- o vocational skills (specific, transferable, avocational).

Many states are directing local educational agencies to establish a "phase" process (Texas, Virginia, Pennsylvania, Georgia) which can provide basic on-going assessment information to a large number of students and a more indepth, comprehensive, time limited vocational evaluation for those students who have been identified as needing more information before career planning, individualized prescriptions, and vocational preparation recommendations can be made. The essential components listed previously cross over and are included in both phases of assessment.

The phases are distinguished by where the assessment occurs and by who conducts the assessment. (Some states delineate two phases, others identify three. For the purposes of brevity two phases are described in this article). Phase One is typically conducted in students' "natural" environments: classroom, home, leisure settings. Assessment information is collected by special education teachers, guidance counselors, vocational instructors, parents, etc. All handicapped and disadvantaged students should participate in Phase One. The developing concept of curriculum-based vocational assessment can serve as an integral part of Phase One. A function of this phase serves to identify those students who would be referred for Phase Two: those who need special adaptations or a more concentrated focus on vocational assessment activities. Services provided in this phase are coordinated and conducted by a trained vocational evaluator. The comprehensive vocational profile which is developed is formed by observing, assimilating, and interpreting students' performances on various "hands-on" work samples, psychometric testing, situational assessments, and job tryouts or shop explorations.

Examples of successful linkage between assessment and instruction as well as the effective integration of vocational assessment into the larger education program can be found in various states. Maryland, Georgia, and Missouri have developed supplemental service programs which include vocational evaluation, assessment and support. This paradigm ties vocational evaluation is directly to instruction. Support staff can participate in assessment activities but primarily they provide whatever service or instructional assistance is needed for success in vocational programs. In Maryland, the Vocational Support Service Team is comprised of two components: vocational evaluation and vocational support. Vocational evaluation focuses on identifying vocational interests, aptitudes, skills, and potentials for training and employment. Vocational support assists students in acquiring the knowledge, skills, and behaviors required for success in vocational training and employment (Cobb & Kingsbury, 1985). Vocational support staff can also perform "spot-check" assessments in a effort to identify reasons for difficulties being experienced in vocational programs or for determining the need to refer students for a complete vocational evaluation (Maryland State Department of Education, 1984).

Further Development and Proactivity

The field of professional activity labeled vocational assessment and vocational evaluation is experiencing a "spurt" in its development and growth. The activities, processes, and formats for providing vocational assessment services are being analyzed, defined, and developed. It is the responsibility of those with experience and training in vocational assessment, particularly practitioners, to provide input into this developmental stage in the profession's growth. For instance, if they have not done so already, far too many local education agency decision-makers are resorting to the purchase of "one-stop, quick-fix" purported anondynes to satisfy the assessment mandate. Most of these instruments or packaged systems are expensive and are not suited to the real and unique needs of students targeted for vocational assessment nor is the information elicited that which is most critical and required by educational and training personnel. These systems may have value for specific purposes, but they need to be customized to fit into the curriculum and competencies required in vocational education. If the intent of the Perkins Vocational Education Act is to be achieved, we in vocational evaluation must work with other professionals to improve the career development, vocational preparation, and quality of life for handicapped and disadvantaged students.

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VOCATIONAL ASSESSMENT AS AN AID IN THE TRANSITIONING PROCESS: A PRACTITIONER'S POINT OF VIEW

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Abstract

The purpose of this paper is to focus on the critical issues of implementing a Vocational Assessment program within the public school setting and the use of Vocational Assessment in moving special needs students through a three-stage Vocational Transition Model.

One of the major problems confronting individuals with a handicap, whether it be congenital or the result of an illness or injury, is the development of a sense of self worth so closely associated with involvement in the world of work.

> "Between 50% to 80% of working age adults, who report a disability are jobless" (Will, 1984).

The percentages become even more devastating when looking at the jobless rates for handicapped youths between the ages of 16 to 21. Within this group 67%, of those students reporting a disability, are unemployed. These percentages become even more shocking when considering recent legislative mandates, such as Public Law 94-142. Public Law 94-142 guarantees the right to a free and appropriate education to all children with handicaps. One of the underlying assumptions of what is meant by appropriate is that this education will lead to a productive life after high school.

In an effort to address these high unemployment rates and to make education more appropriate for each student, emphasis has been placed on what is referred to as "transitioning". Madeleine Will, Assistant Secretary of the Office of Special Education and Rehabilitative Services (1985) defines transition as an "outcome oriented process encompassing a broad array of services and experiences that lead to employment". Transition is also defined as a bridge that connects adequate preparation at the secondary level with the wide array of services available in the community. The Special Task Force on Transition (Will, 1984), comprised of representatives from the Office of Special Education Programs, the Rehabilitation Services Administration, and the National Institute of Handicap Research, views transition as this bridge linking sound preparation at the secondary level with secure opportunities and services in the community. Wehman, Kregel and Barcus (1985) define transition as a process that moves a student through three stages:

> Stage 1 - School instruction, which reflects such concepts as functionalized curriculum, integrated school services, and community based instruction;
>
> Stage 2 - Planning for the transitioning process; and
>
> Stage 3 - Placement into meaningful employment.

The remainder of this paper will focus on the critical issues of implementing a vocational assessment program within the public school setting, and the use of vocational assessment in moving the student through Wehman, Kregel and Barcus' three stage model of vocational transitioning.

Vocational Assessment information is needed in the school setting for two primary purposes:

1. Placement of special needs students in realistic and appropriate vocational programs and
2. Sharing of relevant information with vocational instructors and support staff that will assist them in providing successful vocational education services to the students with special needs (Peterson, 1985).

There are several important issues that should be considered prior to implementing vocational assessment within a school system. Some of the more important issues are:

* How and when vocational assessment should be used?
* How can it be incorporated into current services available?
* How should the results be used?
* What are the most valid and cost effective methods?
* Who should be involved and what are their roles?
* Who should coordinate and be responsible for the vocational assessment?
* How are the fees going to be generated for vocational assessment services?

To ensure an effective vocational assessment several criteria should be utilized. These criteria include:

* Reflect competencies required in vocational training programs and on jobs.
* Involve an interdisciplinary team approach.
* Generate appropriate recommendations for curriculum modificatins.
* Make maximum use of existing school resources.
* Be competency and experience based.
* Utilize informal input, such as teacher reports, school psychologist evaluations, and family concerns.
* Use on a regular, yearly basis to develop the Individual Education Plan (IEP).

Initially, vocational assessment should be used to make recommendations in the IEP that can assist in developing a long term plan. By this it is meant that vocational assessment is implemented early in a student's education program so that a functionalized curriculum can be developed that is realistically oriented and based on the minimal competencies that are required to participate in future vocational programs available through the school. According to Wehman, Kregel and Barcus (1985) this early emphasis on a functionalized curriculum will allow the student to make gains in both vocational skills and in job related skill areas. This will result in the student having a better potential of being employed or becoming employed.

As the student progresses through this functionalized curriculum and as the IEP requires updating, a curriculum-based vocational assessment should be utilized on a yearly basis. According to Peterson (1985), a curriculum-based vocational assessment is a more informal, less intensive process of vocational assessment in which development of student prevocational skills, career awareness, and vocational skills are monitored from elementary school through adulthood. Curriculum-based vocational assessment uses existing assessment data, such as teacher and counselor observations, parent and student interviews, and basic vocational testing that may include vocational interest, aptitude, and awareness testing.

The use of a curriculum-based vocational assessment results in maximum use of resources already available within the school system, reduces the amount of time a student is pulled from the classroom for a formal vocational evaluation, and reduces the financial burden of an expensive formal vocational evaluation.

The yearly use of a curriculum-based vocational assessment helps ensure the continuation of a functionalized curriculum by placing the student in the least restrictive vocational environment and by allowing the student to avail themselves of a variety of programs as their non-handicapped peers do. This allows for what Wehman, Kregel and Barcus (1985) refer to as integrated school services and community based instruction. By integrated school services, they mean exposure to non-handicapped peers and community based instruction allows the student to practice skills in "real" situations.

As students enter Stage 2 of Wehman, Kregel and Barcus' model, planning for the transitioning process, it is important to review what the Office of Special Education and Rehabilitative Services (1984) considers transitioning services. They group transitioning services into three broad classes. These classes are:

1. Generic Services

2. Time-Limited Services

3. On-Going Services

Generic or no special services are those already available within the community without using special disability services (ie...Job Service, Employment Agencies). Time-Limited services are of a temporary nature and are provided by such community based agencies as Vocational Rehabilitation and the Job Training Partnership Act. On-Going services have been lacking, are requiring fundamental change in current policy and practice and are geared at the hard-to-place disabled person. Such initiatives as Work Stations in Industry and Sheltered Enclaves are designed with these concerns in mind.

It is during the second stage that the students, parents and school personnel begin to think about the possible enrollment in specific vocational education and work experience programs. At this point, a vocational evaluation should be completed. A vocational evaluation is a comprehensive, formal and intensive type of assessment that uses work, real or simulated, as the focal point for vocational assessment or exploration (Brolin, 1982). The results of the vocational evaluation can be used to develope a formal transition plan. This plan will delineate the transition services the student will require at the secondary level prior to graduation and the appropriate adult services that will allow for a smooth transition to a work status. These transition plans should incorporate such concepts as comprehensiveness and individualization and should allow for parental input. Comprehensive from the point of view that the student will be leaving the very structured and secure environment of the school and moving into an adult world that is extremely complex both with respect to the skills and behaviors required as well as the wide array of community services available. It should be individualized so that the student will be adequately prepared to utilize the specific services they need to become employed. Parental input is necessary because for many special needs students, their ultimate participation in vocational programs at the adult level is directly related to the knowledge the parent possesses regarding these services.

Vocational assessment becomes extremely crucial at the point of graduation, when the student enters stage 3 of Wehman, Kregel and Barcus' model, which is placement into meaningful employment. At this time, vocational evaluation results should reflect specifically what type of transitioning services are going to be required after the student leaves high school. For those students requiring either time-limited and on-going services, the vocational evaluation can provide detailed information regarding local, state and federal agencies that can provide them with these vocationallly oriented programs, such as work adjustment training, job training and supported employment. Also, vocational evaluation results can make direct recommendations regarding the various employment outcomes available, such as sheltered enclaves, competitive employment and specialized industrial training. At this time, a useful vocational evaluation can be incorporated into any individualized written rehabilitation plans that must be completed at the adult level. Also, hopefully it will shorten the length of time from graduation to the day of entry into an adult program or work status.

Before concluding, it seems important to overview some of the underlying assumptions we have regarding personnel responsible for delivering assessment services. First, the individual should be a highly skilled professional knowledgeable in testing, behavioral observation, and test interpretation. Secondly, this professional should be constantly updating their information regarding local job opportunities and resources within the school and community. Lastly, in order for transitioning to work effectively, the person charged with generating vocational assessment results and recommendations needs to become an integral member of the student's IEP team.

In conclusion, employment is a necessary aspect of human life and an understood outcome of education for all youth graduating at the secondary level. It was the intent of this paper to demonstrate how vocational assessment services can assist school personnel in transitioning students from school to work in an effective and efficient fashion. It is important to remember that vocational assessment is only an aid to the transitioning process. What is most important for us as professionals charged with the actual implementation of transitioning is to attempt to institutionalize the transitioning process into our programs and service delivery systems.

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Applications of the Vocational Decision-Making Interview (DMI) to Vocational Rehabilitation and Special Education

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Abstract

This paper describes the usefulness of the vocational Decision-Making Interview (DMI) for various aspects of vocational rehabilitation and special education. The DMI is an instrument which determines various types of vocational decision-making strengths and deficits of individuals. Several specific areas of usefulness to practitioners in the field are discussed: its general uses; its utility to vocational evaluation services; its use within general counseling and guidance; how the instrument can be of benefit in the development of the Individualized Education Plan (IEP) and Individualized Written Rehabilitation Plan (IWRP); and its use for program development and evaluation.

Most individuals, at some point, must identify their own vocational goals, and make vocational and/or educational decisions appropriate to them. Individuals can vary widely in their capacity to make satisfactory vocational decisions, ranging from those who have made a satisfactory vocational/educational decision with which they are satisfied and which they know how to implement, to those individuals evidencing the "indecisive personality" (Holland & Holland, 1977), which lack the necessary skills to carry out the vocational decision-making process. Individuals with disabilities, however, because of the limitations imposed upon them by their disabilities, are often under more pressure than their non-disabled counterparts to make vocational decisions/choices which are "realistic." Such differences between disabled and non-disabled individuals must be taken into account by professionals concerned with their vocational decision-making capacity.

Of the considerable research which has been conducted in this area, very little has addressed persons with disabilities or other "special populations." Most research dealing with vocational indecision has focussed exclusively upon "normal" high school and college populations (Thoresen and Ewart,1976).

The Vocational Decision-Making Interview (DMI)

A major reason for the lack of research in this area is that there have been few, if any, reliable and valid instruments specifically suited for identifying and classifying the particular vocational decision-making problems of disabled populations. Thus, little can be known about this group's vocational indecisions and about possible remediation or treatment strategies directed toward their unique as well as common problems. Now, however, an instrument to assess and identify disabled individuals' vocational decision-making problems has been developed, and the instrument's reliability and validity have been established. This instrument is the vocational Decision-Making Interview (DMI). It has been shown to be suitable for vocational rehabilitation clients as well as for students in special education settings. The DMI is a 69 item structured interview addressing the actual day-to-day problems in vocational decision-making confronting individuals with disabilities. The DMI is comprised of three broad sub-scales: (1) Employment Readiness; (2) Self-Appraisal; and (3) Decision-Making Readiness. Each of these sub-scales is in turn comprised of more narrowly defined content sub-categories.

The DMI is intended to be individually administered. Each item is a statement which is read to the person. He/she then verbally responds whether for him/her the statement is true, false,

or whether he/she is not sure if the statement is true or false. Being an interview, rather than a test, interpretation and elaboration by the professional (within specified limits) is permitted and indeed encouraged. Therefore, low reading level is usually not a problem with the DMI, particularly since it is written at a grade level of 6.7. Each of the DMI items is scored on a three point scale (True, Not Sure, or False). Additionally, about half the items are followed by open-ended prompts, for which the individual indicates actual content choices for the items. Depending upon the particular characteristics of the individual, total DMI administration takes from twenty to fifty minutes, with an average administration time of about thirty minutes.

The research results with the DMI (described by Czerlinsky et. al.,1982; Strohmer et. al.,1984; Czerlinsky, 1985; and Czerlinsky, Jensen, and Pell, 1985) have been very positive. Although fully described in the above references, a summary of some of the main results with the instrument are the following:

1. Internal consistency analyses (internal reliability) showed that the three DMI sub-scales evidenced satisfactory internal consistency.

2. Test-retest reliability results, with one-week test-retest intervals, showed that the DMI sub-scale scores remained significantly stable over time, with a sample of vocational rehabilitation clients. The reliability coefficients (Pearson rs) ranged from .62 to .80 (all $p.<.01$).

3. In a further test-retest study with special education students, the DMI was administered with test-retest intervals ranging from two weeks to a full school year. Reliability coefficients ranged from .55 to .87 (all $p.<.01$), with no drop in reliability as the test-retest interval increased.

4. A major validity criterion was that the three DMI sub-scales and Total score discriminate between individuals chosen a priori to differ in level of vocational decision-making capacity. This discriminant validity criterion was met, in that vocationally undecided persons (individuals with disabilities just beginning vocational evaluation) scored significantly lower on two of the three DMI sub-scales than vocationally decided persons with disabilities (in vocational training programs). Means of the third scale were in the predicted direction, but did not reach the $p.<.05$ significance level.

5. Another validity study showed that the self-ratings on the DMI of individuals with disabilities correlated highly and significantly with independent ratings, on the same dimensions, carried out by vocational evaluators working closely with these individuals. This supported the interpretation that DMI scores were valid indicators of vocational decision-making strengths and weaknesses of individuals with disabilities.

6. An additional study showed that the DMI is sensitive to treatment interventions directed toward the realm of vocational decision-making. Clients with disabilities were interviewed with the DMI at the beginning of vocational evaluation, and again at completion of this service. Data analyses revealed that each of the DMI sub-scales showed significant mean increases, when post-evaluation scores were compared to pre-evaluation scores. There were no corresponding increases in a control group which did not receive vocational evaluation.

These results attest to the statistical reliability and validity of the instrument. The studies conducted to date with the DMI have been principally concerned with developing and refining the instrument, and with establishing its psychometric properties. That research has shown very positive results for the DMI.

The Utility of the DMI

The DMI is expected to have impact in a variety of settings, and upon a range of services and processes. There are several reasons for this. First, the DMI is a structured interview rather than a test. Thus, it allows the administrator to clarify items which otherwise might have been misunderstood or not understood at all. Secondly, the DMI is verbally administered. This eliminates the problems posed by some other instruments for individuals with a low reading level. Also, this mode of administration make the DMI well suited for use with visually impaired individuals.

An important aspect of the DMI is that it was designed to serve both as a measuring instrument and as a clinical tool. In its measurement capacity, the DMI is capable of determining vocational decision-making skills of groups of individuals, be they special needs students or adults with disabilities. Thus, it can lead to the development of individualized treatment or training programs which can then be applied to the group as a whole. When used primarily in its clinical application, the DMI can help persons initiate or further develop their critical thinking processes. In most cases, however, both the clinical and the measurement components will overlap, and both will be of interest to the examiner.

Vocational Evaluations. A major use of the DMI for vocational evaluations is in terms of providing information. The content areas of the DMI address the real day-to-day problems in vocational decision-making faced by individuals with disabilities. These content areas can give

the evaluator important information, which is often not included with referral information. Patterns of DMI scores may pinpoint the student's preparedness for vocational evaluation and vocational decision-making, and whether the problems are informational, maturational, or stem from lack of decision-making skills. Because of the DMI's format, individuals with limited ability to verbalize their thoughts about vocational decision-making can respond to the items using only the three point scales ("True","Not Sure", or "False"). On the other hand, the open-ended items enable higher functioning respondents to be very specific with their answers. In this way, the instrument is appropriate to a wide range of persons with disabilities.

Secondly, the DMI can be very useful for planning the vocational evaluations. It provides information about which content areas are particularly needed, and, conversely, which seem to pose no particular problems (and therefore could be minimized during the vocational evaluation process). Such information can lead to more precise planning, and thus improve the cost-effectiveness of the overall vocational evaluation process.

Thirdly, when administered at the outset of the vocational evaluation, the DMI has been shown to help establish rapport with the interviewees. This helps ease the tension they may feel in a group or "testing" situation, and demonstrate to them that the evaluator is interested in their welfare and wants to assist in vocational planning by collecting information and soliciting their preferences.

General Counseling and Guidance. The DMI can be used to help individuals identify vocational decision-making problems which can be remediated through the counseling process, or which can lead to expanded counseling to assist with possible psychological, emotional, social, and environmental problems. In this regard, it is appropriate to a wide range of settings and individuals. Thus, the DMI can be used by school based counselors as well as others (vocational evaluators, etc.) involved in developing the client's or student's IEP and IWRP.

IEP and IWRP Development. The development of the IEP and IWRP, a critical aspect of vocational planning, requires focussing upon the establishment of realistic vocational goals. Lack of concrete and accurate knowledge about the individual's vocational decision-making capacities and vocational interests can lead to the development of unrealistic IEPs and IWRPs. The DMI can provide a useful mechanism for assessing individual vocational decision-making skills prior to focussing efforts on development of these plans. Since the DMI provides immediate feedback, in cases where significant vocational decision-making difficulties are identified, the plan may then focus on the remediation of these difficulties prior to beginning specific skill building training programs in occupational areas which would ultimately prove unrealistic or undesirable.

Program Development and Evaluation. Individuals can vary widely in terms of how prepared they are to make vocational decisions, depending on factors such as their abilities, their disabilities, their experiences with diverse career education programs, their environment, and their needs. The DMI can be used to identify some of these unique factors and needs of individuals and groups of individuals. This information can serve as an objective basis for specialized program development directed at those factors and needs.

In addition, research has shown that the DMI is sensitive to the efficacy of vocational evaluation in improving vocational decision-making skills. The instrument, therefore, is sensitive to treatment effects of programs which impact upon vocational decision-making. It should be useful, therefore, in evaluating effectiveness of a number of other vocational rehabilitation programs and services.

Summary

The vocational Decision-Making Interview (DMI) can address various aspects of vocational decision-making capacities of individuals. It can be very useful for service providers concerned with the vocational decision-making processes of special populations.

The DMI can be utilized by professionals concerned with the vocational decision-making processes of special populations to benefit the individuals making the vocational decisions, the professionals themselves, and the programs/services being offered. The instrument can be a positive and important contributor to various facets of improved vocational decision-making.

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WHY DIRECT VOCATIONAL TRAINING WORKS: A THEORETICAL UNDERPINNING

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Abstract

Direct vocational placement for individuals who are severely mentally handicapped is being advocated under a "place-and-train" model as contrasted to the more familiar "train-then-place" model. Under the place-and-train model, the worker learns the job, demonstrates better socialization and is better attuned to the surrounding environment. The theories of Israeli psychologist Reuven Feuerstein offer one explaination for this phenomena. When families, teachers, and vocational trainers provide what Feuerstein calls mediated experiences, the learner can grasp the underlying reasons for and connection between actions. Not only does the work of the vocational trainer provide "mediated experiences" for the client, but the very language of the trainer/coach is clearly aimed at helping the worker to grow in the various cognitive domains. As the growth occurs, the worker becomes more in charge of the job, and comes to understand not only the job but increases his/her understanding of the world around him/her. Feuerstein's theories explain why direct on-the-job training works; it not only trains the worker in the job tasks, but also improves his/her functioning and status in the community.

In the last several years, several authors (Brown, 1985; Bellamy, 1982; Wehman, 1985) have suggested that the classroom or workshop model of vocational preparation is too limiting. Brown has become well known for his belief that even the most severely handicapped student can be vocationally prepared and competitively placed if that student can achieve mastery over at least a single motor skill (Brown, 1985; Drogin, 1985). Brown suggests that the child should be removed from the traditional classroom based on the "developmental model" early on in the educational program and placed in a real vocational setting so that true-to-life vocational skills may begin to be acquired. Suggesting that this should take place at least by the age of twelve, Brown assures his audience that severely multiply handicapped children can be job-ready -- that is, placeable into competitive employment -- by the completion of their school program.

In contrast, current Special Education textbooks suggest that students who are severely multiply handicapped should be taught some cognitive skills (for which we may read, "academic" -- three 'R' -- types of skills) according to a developmental model (Blackhurst & Berdine, 1981; p. 440)." While the emphasis may be upon concrete learning -- for example, not reading per-se, but recognition of important symbols (warning and danger signs, etc) -- and only upon learning in those areas which the teacher or curriculum guide feels will be appplicable to the students' life, the approach is based on the developmental work of Jean Piaget. Pre-vocational and industrial simulation (contract work) programs in adult level programs often follow the same developmental model.

The Developmental Model:

Jean Piaget, the father of the developmental model, has theorized that humans progress through four distinct stages in their cognitive development:

1) sensori-motor intelligence (0-24 months);
2) preoperational intelligence (2-7 years);
3) concrete operational intelligence (7-12 years); and,
4) formal operational intelligence (12 years and on).

The child with a severe mental handicap is usually considered to have slowed or stopped his development in the first or second stage (years one to seven).

The developmental model of education suggests that materials be presented in stages and substages which build upon each other in the same manner as Piaget theorized that human cognitive development builds upon itself. In theory, the learner builds his knowledge by transfering knowledge learned in one area and generalizing to new applications. Piaget labels these processes: reflective abstraction, assimilation and accomodation, and equilibration.

The teacher and the teaching strategy try to parallel the natural learning process and, by design, try not to overwhelm the student by presenting material for which the student is not developmentally ready. Objections to this strategy are based on the fact that it "waits" on the student, demanding of him that the student grow and develop before advancing. An element of challange which respects the individual's innate ability to advance on his own is lacking.

Bellamy and Wilcox (1982) have pointed out that this method tends to make individuals who are severely multiply handicapped into eternal children becauses it traditionally focuses on their "mental age" rather than on their chronological age. Freagon (1982) suggested that the process is self-limiting and that rigid adherence to the developmental model "rarely, if ever, results in a gain of more that 1 or 2 developmental years over the entire course of their educational experience (p. 10)."

All of these authors suggest that principles other than those of the strict developmental model of cognitive learning should be used in designing and carrying out instructional activities in schools for potential workers who are severely handicapped. First: the emphasis must be upon the acquisition of those functional skills frequently demanded in the natural environment (Brown adds that age twenty one and after should be the reference point for identifying the age appropriateness, that is, functionality of skills). Second: activities should be appropriate to the chronological age of the students. Third: there should be regular and continued contact with the non-handicapped world, especially with peer groups. Fourth: the long range goal should be directed towards assisting the severely handicapped student in living and working as independently as possible in the community (Heward & Orlansky, 1984; p. 340 1). The providers of adult programs often need to be reminded to follow similar guidelines in order to truly focus on the "adultness" of their clients, enhancing and reinforcing this attribute and role.

Brown (1985) cites the work of other special education and vocational specialists in support of his argument, as well as describing many case studies and comparative studies which he has supervised. Particular mention is made of Marc Gold (1974) who perfected a rigorous stimulus-response method of helping individuals who were seriously handicapped to become proficient at complex assembly tasks. Others (Bellamy, Peterson & Close, 1976; Hunter and Bellamy, 1976; O'Neil & Bellamy, 1976) have also demonstrated the feasibility and success of such an approach.

In the operation of this model, each skill or vocational output expected of the learner is broken down by careful task analysis into discrete sub-tasks. Each sub-task is, then, carefully "learned" and coupled to previously learned subtasks until the learner is able to string them all together to perform the entire task (McLeod, 1985). The trainer stays with the worker and patiently reminds him to consider the task at hand and to keep trying different ways of accomplishing the task until the worker has actually stumbled upon the correct way. When the worker has arrived at the correct way, he is praised, reinforced, and encouraged to undertake the next step in the sequence. By continually and carefully going back over the steps previously learned and connecting them with the newly learned steps, the worker is encouraged to learn and remember the entire complex assembly process. The emphasis is upon learning by doing until the concrete task is mastered.

Brown (1985), Bellamy (1982), and others have suggested that by moving to the realm of the concrete and by changing to a rigorous stimulus-response operant learning methodology, workers who are severely multiply handicapped can be trained to function in competitive employment and in the areas of personal maintenance and socialization as adults in the adult world.

Brown (1985), in a very straightforward manner, suggests that individuals who are severely multiply handicapped do not generalize and can not be expected to apply skills learned on one task to another task -- "there is little or no transferability of skills; however, the time needed for learning new tasks diminishes as the learning progresses (Brown, 1985)."

Because of this, almost all the authors, including Bellamy and Brown, advocate the use of real-life training situations. Whenever possible the exact situation which the student uses or will use in his own life outside the classroom should provide both the subject matter to be learned and the actual training site.

Thus, Brown's trainers and students are found in the corner market, at the neighborhood laundromat, and in the city's industrial sites, working one-to-one with their trainees until skills have been thoroughly learned, reinforced, and can be maintained without continual monitoring.

The Question:

Not only do the trainees really learn the skills they have been taught, apply them appropriately, retain competitive employment, and therefore begin to function in the community; but -- in the words of Brown (1985) -- they become more alive, they seem to learn more, and increasingly they respond and interact with their environment. In short, they display an adaptation that goes beyond the specific skills which they have learned (been taught). Why?

Feuerstein: Dynamic Assessment/-Instrumental Enrichment:

Neither of the two models -- the stimulus-response learning model, nor the Piagetian developmental model -- properly account for this further adaptation to their surroundings.

Reuven Feuerstein, a student of Piaget's and now an Israeli psychologist, has suggested that in all of the cognitive domains -- the substages and stages of Piaget's network -- it is not how much the student currently uses a domain (a static measurement), but rather, it is whether or not the student has the ability to use the domain which determines potential capacity (a dynamic assessment). Feuerstein believes that we all have the potential to function in all of the cognitive domains and that students can be taught to develop and use all of their cognitive domains even those which up to this time have remained passive.

It is this passive interaction with the environment which characterizes retarded functioning according to Feuerstein's line of thought. Individuals whom we characterize as being retarded function as passive receptors, not as active generators of information. This situation can be remedied according to Feuerstein. What is needed is not simply interaction with the environment but mediated experience wherein an experienced mediator transforms/reorders/organizes/-groups/explains the environment so that the learner can grasp the underlying reasons for and connections between actions.

Consider the two requests: (a) "Go to the store and buy three bottles of milk" and (b) "Go to the store and buy three bottles of milk so that we'll have enough left over tomorrow when the stores are closed." In case (b) the child receives not only the request but gets insight into the thinking behind the request; what is important is not the specific content of the experience (learning about buying milk ahead of time), but the extent to which the experience is explained and provides insight into the thinking process (learning to think ahead, having control over possible future occurences) (Chance, 1981). The added phrase signals the mediating action in this example; the continual interaction of this type between mediator (teacher/parent/trainer) and the learner over time produce the mediated experience which the learner uses to transform himself.

A Synthesis and Answer:

Feuerstein provides a possible answer to our question. Why do severely multiply handicapped students given real-world direct vocational and social skill training seem more alert and more able to cope effectively in other realms in the community? While not actually following the formal intervention program, Instrumental Enrichment, as developed by Feuerstein, it appears that the one-to-one training of the place-and-train model has some of the same effects as this program. The trainers serve as mediators of the environment for their charges and the rigorous task training parallels the activating of the previously unused cognitive domains as discussed by Feuerstein.

In his second book, Instrumental Enrichment, Feuerstein (1980) lists a series of cognitive deficiencies often found in the retarded learner. Although the descriptions might be more formally psychological than those used by a vocational trainer, they describe the types of problems encountered by a trainer when introducing a severely multiply handicapped learner to a complex vocational or self-help project. The list partially includes:

(a) Blurred and sweeping perception;
(b) Impulsivity;
(c) Lack of verbal skills (lack of ability to elaborate cognitive relationships and operations between pieces of a whole);
(d) Lack of, or impaired, spatial and temporal orient tion;
(e) Lack of, or impaired, conservation of constancies;
(f) lack of trial and error responses;
(g) Deficiency of visual transport;
(h) possessing an episodic grasp of reality (Feuerstein, 1980; p. 73-103).

In effect, when the trainer breaks an operation down into its component tasks and patiently teaches the learner to perform each subtask completely and in sequence, the trainer is mediating the learning experience (environment) for the student. The dictum: "learning to attend to task" is the Vocational Trainer's umbrella phrase paralleling Feuerstein's "sharpening perception, reducing

impulsivity, more clearly defining relationships between the learner and the task, and reducing episodic views of the task." In a simular manner, Marc Gold's "Try another way" requires the learner to formulate and reformulate relational concepts between parts of the task being performed, to engage in trial and error activity, and to develop a keener sense of spatial and temporal orientation, in efforts to master the task.

The task analsysis and the job-coach's patience become filters through which the learner is taught how to improve his/her functioning in the cognitive deficit areas mentioned above. Since Feuerstein sees these domains as affecting both each other and the overall functioning of an individual, we can conclude that the well taught vocational/self help skill student will begin to exhibit better functioning skills in a wide variety of interactional domains strictly beyond the training which he/she has received.

The place-and-train model is an effective mode of vocational and social skill training. More importantly, it restores individual dignity because it assumes that the trainee will learn and develop. Despite the stimulus-response methodology, it can be said to be more humanistic and developmental than the instructional models it leaves behind, because its methodology parallels the far-reaching developmental strategies of Feuerstein.

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A STUDY REGARDING PLACEMENT AND PERFORMANCE OF STUDENTS RECEIVING VOCATIONAL EVALUATIONS

LORETTA EVANS

Abstract

Matching student's skills, abilities, and interests to vocational curricula is commonly believed to be necessary for success of handicapped students in vocational training programs. During the last ten years, school systems have increasingly recognized the importance of vocational assessment prior to placement of special needs students into vocational programs. The passage of Public Law 98-524 in 1984 mandates vocational assessment for any handicapped, disadvantaged, or limited English proficient student who enrolls in vocational education programs. Public school systems are rapidly responding to this mandate. This study was conducted by the vocational evaluation staff of Louisiana Educational Planning Region V. The main thrust of the study in regard to student placement in vocational curricula dealt with ratings of students, by vocational education teachers, who were placed in accordance with vocational assessment report recommendations and ratings of students placed in areas not recommended by vocational report recommendations. Student ratings dealt with such individual areas as effort, attitude, attendance, attention span, acceptance of boredom, work quality, and grade average, and such group functioning areas as getting along with others, accepting supervision, and following instructions. Overall performance of the students was also rated. There were significant differences in nine of the eleven rating areas between students who were placed according to recommendations and students who were not placed according to recommendations when the data were subjected to a chi square analysis. Details of the methodology and findings will be discussed.

During the last ten years, school systems have increasingly recognized the importance of vocational assessment prior to placement of special needs students into vocational programs. The passage of Public Law 98-524 in 1984 mandated vocational assessment for any handicapped, disadvantaged, or limited English proficient student who enrolls in vocational education programs (Federal Register, 1985). Public school systems are rapidly responding to this mandate.

The immediate goal of vocational assessment in an educational setting generally is to define vocational interests, strengths, and limitations to assist in the career planning process for each student. Vocational assessment also emphasizes the identification of appropriate services which are likely to facilitate the vocational development of the student. It is then possible to predict the likely functional outcomes which will occur as the direct result of vocational assessment services (McCray, 1982).

Background Information of the Study

The five school systems of Louisiana Educational Planning Region V, with a total student enrollment of 54,625, joined together in a consortium arrangement in 1982 to establish the Region V Vocational Evaluation Center. The purpose of the center was to provide vocational assessment services for high school special needs students. Vocational assessment data would then be used by the student, his parents, educators, and other members of the IEP (Individual Education Plan) Committee to make decisions when planning the student's vocational training program.

Funding for the program has come from several sources including the Louisiana State Department of Education, vocational and special education divisions, local school district funds, and the local agency administering Job Training Partnership Act funds. The evaluation center has a staff of eight people, including a unit coordinator, job placement coordinator, two vocational evaluators, two testing technicians, and two clerks.

This study was conducted by the vocational assessment staff of Louisiana Educational Planning Region V (Evans et. al, 1985). The main thrust of the study in regard to student placement in vocational curricula dealt with rating the performance of students who were placed in accordance with vocational assessment report recommendations and rating the performance of students placed in areas other than those recommended in vocational assessment

reports. Performance of special needs students involved in the study were rated by vocational education teachers.

Objectives of the Study

Statement of the Study

Vocational assessment services were first available to 1,489 identified special needs students enrolled in high schools in Educational Planning Region V during the first operational period of the Region V Vocational Evaluation Center (1982-83). None of the students who were enrolled in vocational classes at that time had received vocational assessment services, therefore, placements in vocational classes were made on the same basis as regular students. Vocational assessment data are now available for use in making vocational placement decisions for special needs students. Over 1,200 students have received a Level II vocational assessment as of January 31, 1986.

The first objective of the study was to determine appropriateness of program placement recommendations made the year prior to student placement in vocational programs. In making this determination, some degree of predictive validity of training recommendations could be ascertained.

A second objective of the study was to find out whether there was a difference in performance of students placed in vocational classes recommended in the vocational assessment report and those placed in vocational classes other than recommended in the vocational assessment report.

Methods and Procedures

Sources of Data

The population for this study consisted of 138 special needs students who were currently enrolled in vocational education classes and who had received a vocational assessment prior to placement. Each student had received a Level II vocational assessment as recommended by Louisiana State Department of Education's proposed vocational assessment model. The Level II vocational assessment consisted of:

1) a computerized vocational interest inventory and multiple aptitude test battery
2) a parent, teacher, and student interview
3) a color discrimination test
4) a review of special education data

A small number of students received a Level III vocational assessment prior to placement. The student population consisted of 85 Learning Disabled, 13 Mild Mentally Retarded, 39 Slow Learners or Educationally Handicapped and 1 Behavior Disordered.

Instrumentation

The data collection instrument was designed for vocational education teachers to rate student performance in various categories, including "Overall performance".

Each vocational education teacher rated student performance on a scale of 1 to 6, with a rating of 1 being "very poor" and a rating of 6 being "excellent".

The data collection instrument contained a description of ten performance areas. These performance areas were: effort, attitude toward work, ability to get along with others in the class, ability to take directions or supervision in class, appropriate behavior on the job, ability to complete a job and attention span, ability to accept boredom and repetition on the job, attendance in class, quality of work produced, overall performance, and grade average in the class. Each respondent circled one response on the rating scale for each performance item.

Collection of Data

During March 1985, lists of students who had received a vocational assessment during the first operational period of the center were sent to secondary counselors in the five parishes. A cover letter was attached, requesting information on vocational class placements of these students during the second operational period of the center and the names of each vocational education teacher teaching those classes.

During the first week of April 1985, data collection instruments were distributed to all vocational teachers teaching special needs students who had received a vocational assessment a year prior to placement.

Analysis of Data

The data provided by vocational education teachers were compiled on the basis of students who were placed according to vocational assessment recommendations and those placed in areas other than recommended. A chi square test (X^2) for significant difference was applied to all performance ratings for each group. The chi square test (X^2) is used to estimate the liklihood that some factor other than chance accounts for the difference between the success or lack of success of the two groups.

Results

A significant chi square (X^2) finding in seven of the ten performance areas is illustrated in Table I. The expected frequencies (fe) are contrasted to the observed frequencies (fo) in each rating category for each item. There was significant difference at or beyond .01 level of confidence in the following performance areas in favor of ratings of students who were placed according to

vocational assessment report recommendations: (1) effort, (2) attitude toward work, (3) taking directions or supervision, (4) attention span and ability to complete job, (5) ability to accept boredom and repetition on the job, (6) quality of work produced, and (7) overall performance.

There was also significant difference in the area of "grade average" at the .05 level of confidence in favor of ratings of students who were placed according to vocational assessment report recommendations.

There was no statistically significant difference at the .05 level of confidence in ratings of students in the performance areas of "getting along with others" or "appropriate behavior on the job".

The results indicate that placement of students in vocational areas recommended as a result of vocational assessment and successful performance ratings tend to be systematically related, rather than occurring by pure chance.

Educational Importance of the Study

Matching student skills, abilities, and interests to vocational curricula is commonly believed to be necessary for success of special needs students in vocational training programs. Special needs students had a significantly higher overall performance record in vocational classes when they were placed in accordance with their assessed interests and abilities. One educational implication of this finding is that the vocational education needs of special needs students may be better served if each student's interests and abilities are determined prior to placement in a vocational program.

A second educational implication is that vocational assessment data appear to provide a strongly reliable means of forecasting probability of success when the student is placed in recommended program areas.

FIVE PARISH REGION

SUMMARY REPORT OF INFORMATION, FORM 1-B

REGION V VOCATIONAL EVALUATION FOLLOW-UP STUDY

SPRING 1985

TABLE I

Chi Square Values for Ratings of Students by Vocational Education Teachers Who Were Placed in Accordance With Vocational Assessment Report Recommendations and Ratings of Students Placed in Areas Not Recommended in the Vocational Assessment Report

Item	Placed According to R...										Not Placed According to Recommendations										X^2 Value	Level of Significance
	Very Poor		Poor		Fair		Cor...		Good	Excellent	Very Poor		Poor		Fair		Good		Very Good	Excellent		
	fo	fe	fo	fe	fo	fe	fo	fe	fe	fo fe	fo	fe	fo	fe	fo	fe	fo	fe	fo fe	fo fe		
Effort	2	3	4	9	12	17	29	25	19 16	8 5	2	1	11	6	15	10	8	14	7 10	0 3	22.65	.01
Attitude	1	3	3	7	15	19	25	20	23 20	6 4	1	1	8	4	17	11	6	11	9 12	1 3	22.83	.01
Getting Along	0	0	3	5	15	15	19	21	20 20	14 10	0	0	5	3	9	9	14	12	12 12	2 6	6.92	N.S.
Taking directions	0	1	9	9	6	14	29	28	25 17	3 3	2	1	5	5	16	8	16	17	7 10	1 1	24.83	.01
Behavior	1	1	1	3	15	19	25	22	24 22	7 6	1	1	3	1	15	11	9	12	11 13	2 3	9.77	N.S.
Attention span	4	4	8	10	9	18	30	25	18 14	3 2	2	2	8	6	19	10	10	15	4 8	0 1	20.98	.01
Accept boredom	2	2	9	14	16	19	25	24	21 14	1 1	1	1	13	8	14	11	13	14	1 8	0 0	15.95	.01
Attendance	1	1	6	6	5	10	19	21	27 25	15 10	0	0	4	4	10	5	14	12	13 15	1 6	15.12	.01
Work quality	4	5	0	6	26	26	22	21	15 11	6 4	4	3	10	4	15	15	11	12	2 6	0 2	22.78	.01
Overall performance	1	2	4	8	18	23	27	23	18 13	5 3	2	1	9	5	18	13	10	14	3 8	0 2	21.43	.01
Grade average	0	0	3	6	5	9	35	33	25 22	5 3	0	0	6	3	9	5	17	19	10 13	0 2	14.24	.05

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VOCATIONAL ASSESSMENT IN THE PUBLIC SCHOOLS

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Until recently vocational assessment in the public schools has been discussed much like the weather. People talked about it but no one really did very much about it. Although it has been recognized for many years that vocational assessment is important to provide handicapped students, the actual implementation of the service has been only minimally accomplished over the past twenty years...until recently.

It has taken another federal impetus to draw attention to this important educational need for students with special needs. The Carl D. Perkins Vocational Education Act of 1984 and the Transition from School to Work movement stimulated by Madeline Will, Assistant Secretary for the Office of Special Education and Rehabilitative Services are making educators grapple with the question of how to respond to these requirements so that vocational assessment can become an integral part of the services to handicapped children and youth.

The special education field has a broader view of the assessment needs of the handicapped students. The term career assessment is used to reflect the position that it is attempting to prepare the student for all the major work roles that are required of productive adults--work on a job, work in the home, community/volunteer work, avocational activities, and recreational and leisure activities that are of benefit to oneself and others. Thus, vocational assessment is a part of career education. This is presented in a position paper by the Division on Career Development (DCD) which views career assessment as..."a continuous process integrally related to the ongoing instructional program for the handicapped learner" (Sitlington et al., 1985, p. 4).

There has never been a more opportune time to implant vocational assessment into the public school system so that more appropriate education and training can become available to students with special needs. However, most schools are perplexed about what to do. A national survey in 1981-82 of vocational education, special education, and vocational rehabilitation state agencies (Peterson, 1985) supported this contention by finding these agencies unclear as how to best implement vocational assessment.

There are several issues or questions that need to be addressed and answered before school administrators will be responsive to what most of us think is obvious--the inclusion of substantial vocational assessment services in their schools. This paper will address six: 1) is it the school's responsibility; 2) if so, when should it begin; 3) what is its purpose; 4) how should it be done; 5) who should do the assessment; and 6) how can it be implemented? A conceptual comprehensive model will then be presented for the reader's consideration.

Some of the Issues

Is Vocational Assessment the School's Responsibility?

In the past two years there have been several national, regional, and state conferences on transition which have brought together representatives from education, rehabilitation, developmental disabilities, parent/advocacy groups, and others to identify problems and solutions to the successful transition of handicapped students from school to work. A consistent finding from these conferences is the need for more career and vocational education and to implant vocational assessment in the schools (Great Lakes Conference, 1985; Great Plains Conference, 1985, and others).

Additional support to the provision of vocational assessment in schools has come from a national study commissioned by the federal government to Harold Russell Associates (1984) to determine the necessary components of successful transition from school to work in secondary programs. A study of secondary special education programs in Oregon (Halpern & Benz, 1985) also found vocational assessment to be a necessary ingredient for the success of handicapped learners.

Several recent follow-up studies of former special education students give further support to implementing more adequate services for handicapped students (Fardig, et al., 1985; Hasazi, et al., 1985; Levine, 1985; and Mithaug, et al., 1985). These studies clearly reveal that most former students have serious unemployment and independent living problems after they leave the school system. Some particularly disturbing findings are that most students are not getting the vocational coursework and programming mandated by the law, and that only a small number find their way to the agencies that are charged with serving them as adults when they have vocational and independent training needs.

This issue seems clearly answerable. Schools must do much more than they are now doing if handicapped students are to be successful as adults.

When Should Vocational Assessment Begin?

At the present time, the vocational assessment that is being done in schools is primarily at the secondary level, particularly high school. However, the conferences, the studies noted previously and writers on the subject (e.g., Peterson, 1985; Sitlington, et al., 1985) are recommending that some type of vocational assessment begin at the elementary level. This has been my experience when speaking with elementary special educators who are vitally concerned about the career development of their students.

Many years ago, Dawis, Lofquist, & Weiss (1968) developed their Theory of Work Adjustment, a vocational development theory giving considerable emphasis to the importance of one's environment and early experiences in forming the individual's work personality. The work personality is an individual's unique set of abilities and needs that form the foundation for future vocational attitudes and interests and is seen as forming shortly after birth. The kind of reinforcers experienced in the home and (school) environment are very significant in the proper development of the person's work personality according to this theory.

If you can accept this premise, and I have for many years, then it follows that what we are talking about--vocational assessment--is very critical to incorporate in our schools during the elementary years if our students are to acquire the proper work habits, attitudes, motivations, interests, and abilities that can meet their unique set of characteristics and needs.

This issue is still being debated. Many believe we are pigeon-holing students too quickly by starting the vocational process in the elementary years. In my opinion, and those of many others, we are not. In fact, this may be the most critical time if the students are to have any chance for vocational success in later life.

What's the Purpose of Vocational Assessment in the School?

The benefits of students by receiving vocational assessment during their school years are innumerable. A few examples are as follows: 1) it helps students develop a greater sense of self-awareness about vocational interests, abilities, needs, and the occupational possibilities that relate to them; 2) it is a motivating tool for strengthening self-concept and self-confidence by showing students what they can do rather than what they can't do; 3) it helps identify ways in which students can learn more appropriately so that instruction can be modified and improved and career development enhanced; 4) it leads to more appropriate vocational goals so that realistic vocational training and job placements can be selected; and, 5) it helps parents, educators, and agency workers in providing the most beneficial services to the individual.

In my opinion, there are three overall purposes or levels of vocational assessment that should be provided for special needs students. Level 1 should begin sometime in the elementary years and have as its major purpose the development of the student's work personality,

i.e., the necessary self-awareness, occupational awareness, interest specification, ability development, work habits, motivation, and decision-making skills that will result in selecting appropriate vocational training and job aspirations. This prevocational assessment is the foundation upon which later success is dependent. It is inextricably related to curriculum and instruction and appropriate educational planning for the student and should continue into the high school years as necessary.

Level 2 vocational assessment should begin around the 8th or 9th grades and have as its major purpose the determination of appropriate vocational education and other vocational training opportunities. Level 3 vocational assessment is the more familiar vocational evaluation and should begin in the 11th or 12th grades. This is a more comprehensive assessment which is directed to the real work world of the student's community. Its major purpose is to determine how the student's interests, needs, and abilities can be matched closely with specific job requirements in the community's labor market.

This issue concerns whether or not the school can be expected to provide such a comprehensive three-tier vocational assessment service and if not, how can community resources and parents be involved to meet student needs. It would seem with the great emphasis today on transitional planning that this would be a good time to coordinate with other resources if the school is unable to provide all of these services.

How Should Vocational Assessment be Done?

Many persons in the schools are misinformed about the tools of vocational assessment. Some believe a commercial vocational evaluation system or two is what this requires. Others believe a series of psychometric instruments are the solution. In general, most people don't really know what they should use to conduct student vocational assessment, at least this has been my experience.

Several leaders in special education who are knowledgeable about vocational assessment support a curriculum-based vocational assessment approach (Clark, 1985; Peterson, 1985; Peterson & Petersen, 1985; Phelps & McCarty, 1984; Sitlington, et al., 1985; Stodden, 1985; and others). They believe vocational assessment should be an ongoing, continuous process that provides for individualized education program planning from K-12+. Others believe it is important to conduct vocational assessment away from the school environment so it can be more reality-based (Bicanich & Leconte, 1985; Kaplan, 1985, and others). Gruenhagen & Mohr (1985) suggest that a psychovocational evaluation model can be systematically used in IEP planning. Vocational evaluation labs and mobile evaluation units have also been used frequently for school populations. Peterson (1985) recommends a "comprehensive developmental approach" by combining the curriculum-based approach with the vocational evaluation center model.

The curriculum-based and psychovocational assessment approaches lend themselves to Levels 1 and 2 which were presented in the preceding section. For Level 1, vocational assessment can be part of the career education effort which focuses on career awareness and career exploration activities infused into the academic subjects of both regular and special education classes. Students can be vocationally assessed through:

- career information and feedback
- career games
- speakers
- field trips
- career assignments
- special projects
- hands-on experiences with various occupational tools
- home assignments
- values clarification activities
- role-playing, and
- with carefully selected interest, social, and aptitude measures.

Level 2 adds the prerequisite of entry level skills assessment necessary for entrance into and success in various vocational education courses and training areas. Level 3 assessment should consist of work samples, situational assessment, job shadowing/work experience, vocational counseling, standardized testing, and, if possible, computerized occupational information and job matching systems.

Presently, special educators, vocational educators, school psychologists, and vocational rehabilitation evaluators view vocational assessment in a somewhat different perspective because of their particular orientation, training, and purpose. The issue then becomes how to come to a reasonable consens. bout the most appropriate methods of conducting vocational assessment for these students. This presents a very interesting dilemma.

Who Should Conduct the Vocational Assessment?

Because comprehensive and ongoing vocational assessment spans a considerable time frame, there is no one person who can or should be charged with the responsibility. Thus, a variety of school and rehabilitation personnel should be involved. For Level 1, special educators, regular class teachers, school counselors, vocational teachers, school psychologists, and even parents can be contributors to the development of the student's work personality. However, someone must orchestrate the assessment

so that the student's interests, needs, values, aptitudes, abilities, and limitations noted after each career education experience can be assessed and addressed. The most logical person to do this is the special educator.

Level 2 requires either a vocational educator with assessment and special education background or a certified vocational evaluation specialist with some vocational education background. They must work in cooperation with the special educator orchestrating Level 1 activities.

Level 3 assessment should require a certified vocational evaluation specialist with assistance from those responsible for Levels 1 and 2. This could be done by a community agency (if there is one) or by a school-based evaluator. There are some positive advantages of having this assessment done outside of the school environment but care must be taken that the setting is not devaluing to the student.

This issue is a major one! Not only do we have the different orientations to assessment that were mentioned in the previous section, but the shortage problem of qualified persons at all three levels. And, in many instances, schools do not have the necessary funds to employ such specialists. If current personnel, such as special educators, cannot be given enough release time from their other duties for vocational assessment coordination, then what?

How Can Comprehensive Vocational Assessment be Implemented?

This is a major issue! It is not easy to make substantive changes in public school systems. A great deal of bureaucracy exists and the number of decision-makers seems endless. It is usually impossible to determine who is really responsible. Special education services are only one small part of the larger public education system which engenders a great number of pressures and priorities also needing immediate attention. Thus, the machinery for change moves very slowly in the schools.

The Carl Perkins Act is one way to initiate change but it doesn't tell us how to do it--just do it! It is up to us (as usual) to determine what and how it can be done. Local educational agencies (LEAs) are independent entities from the Board of Education down to the principals, teachers, and parents. The success code is hard to crack and thus it takes an all out effort to make change of substance really happen. If it does happen, it may take years!

Implementing Level 1 vocational assessment may be the most difficult, at least at the elementary level. The best way I can think of to implement it is by making it a natural part of the educational services being provided to all students--especially career education if it is being utilized. There are many persons working toward this end and hopefully it will eventually become a reality. Otherwise, the best that will probably occur is when those special educators who are convinced of its need do it...with or without the assistance of other educators. It is happening now in several places.

Level 2 now becomes more possible because of the Carl Perkins Act requirement that every handicapped student who receives vocational education be assessed for interests, abilities, and special needs prior to entrance in such programs. Most schools will hopefully want to be in compliance of the law. Thus, it becomes a matter of quality assessment rather than assessment for assessment sake! Being able to provide qualified personnel to carry out this mandate is a major problem.

Level 3 becomes difficult to implement adequately because of two particularly critical reasons: 1) the lack of qualified vocational evaluators, and 2) the lack of funds to hire such personnel. In Missouri, over 40 evaluators are employed from vocational education special needs funds and in Minnesota there are 27 school evaluators. But, these numbers are only a tip-toe into the water. With the critical shortage of trained evaluators and no relief in sight, the reality is that special and vocational educators will need to be trained to meet the need in most instances.

In summary, although vocational assessment in the schools is a national priority, there are many problems in responding to the need. The lack of trained personnel is a major proolem which presents the issue of who can competently do the job. Unless the vocational evaluation community is responsive, we will continue to perpetuate the inadequate vocational preparation that handicapped students have received during their school years for decades. The transition movement presents the opportunity for rehabilitation personnel to begin a closer collaborative effort with schools and to form a partnership that will enhance the services of both systems while implanting a more comprehensive vocational assessment source for the students.

A Proposed Model

It is a known fact that everyone in this business must present his or her own model to meet the needs of a certain group of individuals. I am no exception but do realize that others have gone before me and that I have probably very little new to add other than my biased perspective. But, I do want to have the opportunity to present my conceptualization of an ideal model to meet the vocational assessment needs of handicapped and other special needs learners.

For almost 15 years my associates and I have been developing a competency based life-centered career education curriculum that is intended to address the career development and adult adjustment needs of handicapped students K-12+. Based on our research and development efforts with a wide variety of school systems, we have identified 22 major competencies and about 100 subcompetencies needed by special education students (and probably all others) for career/vocational success. The 22 competencies are presented in Figure 1.

The curriculum is published by the Council for Exceptional Children (CEC) (Brolin, 1978, 1983) and there will be a third edition after the conclusion of two more federally funded special education projects. The next edition will include a LIFE CENTERED CAREER EDUCATION (LCCE) INVENTORY which will consist of two versions: a series of knowledge tests for 20 of the 22 competencies and their subcompetencies, and a criterion-referenced performance-based version which will assess the student's ability to perform in all competency areas except #21. Many of these competencies relate to vocational assessment areas. Thus, the LCCE INVENTORY should address the Level 1 assessment area very well as it is also directly tied to curriculum-based instruction. It is, however, only for EMH and SLD students who are in grades 7-12 although eventually it will probably be expanded for use with other disabilities and grade levels.

The vocational assessment model that I would like you to consider relates to the LCCE TRANSITION MODEL that we have conceived in one of our projects. It includes the four stages of career development described earlier (awareness, exploration, preparation, and placement/follow-up/continuing education), the LCCE competencies, and basic academic skills education. The three levels of vocational assessment outlined in this paper are incorporated into the model as illustrated in Figure 2. Responsibilities for vocational assessment are also depicted in the model.

The model basically recapitulates what I have been describing through this paper. It is my belief that if we are to adequately address the challenge of curtailing the high rate of failure that handicapped students experience as adults, then we must refocus their education from elementary years onward. To do anything less will probably mean the continuance of today's dismal outcomes.

Figure 1. Life-Centered Career Education Education Competencies

Daily Living Skills

1. Managing finances
2. Selecting and managing home/apartment
3. Personal needs
4. Family living
5. Food preparation
6. Clothing care
7. Civic activities
8. Recreation and leisure
9. Getting around community

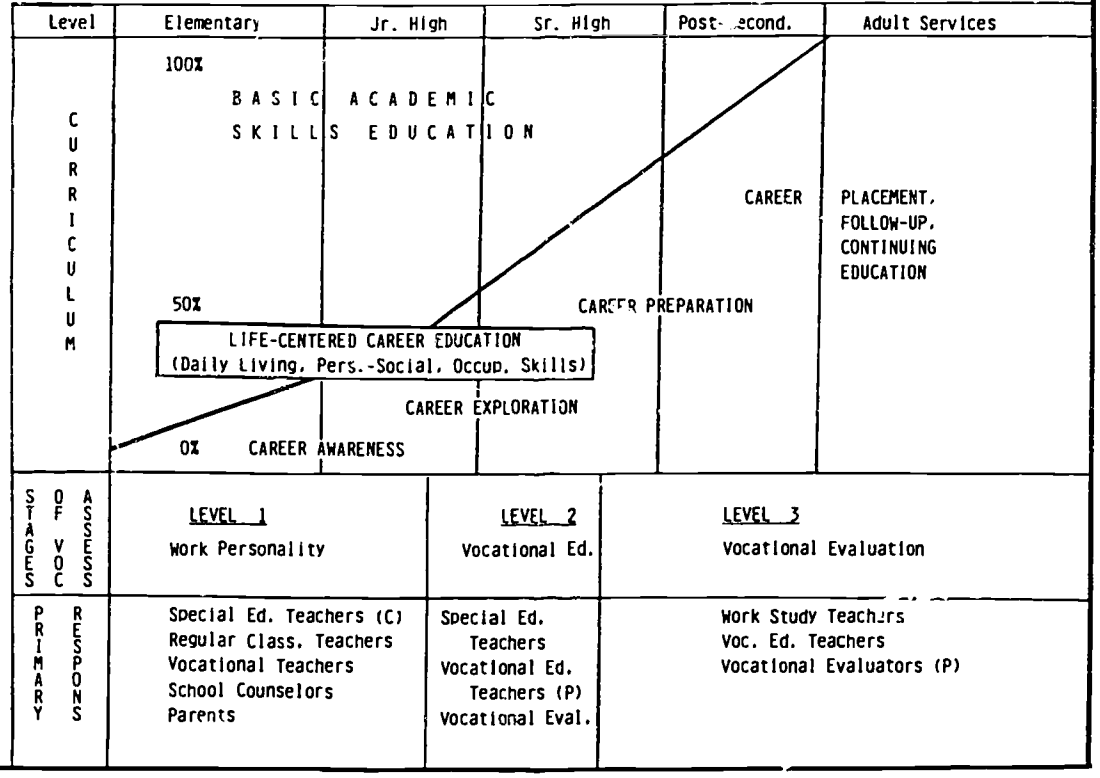
Personal-Social Skills

10. Self-awareness
11. Self-confidence
12. Socially responsible behavior
13. Interpersonal skills
14. Independence
15. Problem solving
16. Communication

Occupational Skills

17. Occupational awareness
18. Occupational choice
19. Work habits, behaviors
20. Physical-manual
21. Occupational skills (entry-level)
22. Job-seeking and maintenance

Figure 2. Vocational Assessment Model



Conclusion

This paper has portrayed the significant challenge that the public schools face if vocational assessment is really going to become an important component in the preparation of handicapped and other special needs learners. A major thesis presented was the importance of the early years in forming an adequate work personality which necessitates a systematic three-level approach for comprehensive vocational assessment. Although the challenge for implementation is great, it is not insurmountable. Many persons are working toward this end. Professional organizations like the Division on Career Development, National Association of Vocational Education Special Needs Personnel, Vocational Evaluation and Work Adjustment Association, and others are continuing to make inroads as they attempt to change the educational system in such a constructive way.

Vocational assessment for special needs students is a challenge. We must avoid viewing the students, however, as deviant but rather as needing to be provided with a learning environment that will facilitate their career development. Most of these individuals must operate in frustrating and often rejecting environments. They must develop a healthy work personality and experience success as they strive to become independent and productive citizens in our society.

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COMPARISON OF VOCATIONAL EVALUATOR POSITIONS IN TRADITIONAL VOCATIONAL REHABILITATION, SCHOOL, AND PRIVATE-FOR-PROFIT SETTINGS

STEPHEN W. THOMAS

Abstract

A survey of vocational evaluator positions and needs was conducted through the Fall 1984 issue of the VEWAA NEWSLETTER. Completed surveys were sorted into the three different vocational evaluation employment settings of: traditional vocational rehabilitation, school, and private-for-profit. The resulting study compares evaluators in the three settings by a wide range of demographic, educational, financial, environmental, process, and instrumental factors.

In an attempt to identify and analyze the current employment positions, job duties and characteristics, and professional needs of vocational evaluators, the Vocational Evaluation and Work Adjustment Association (VEWAA) decided that a survey of the membership should be conducted. An extensive 39-item survey was developed and printed in the Fall 1984 (Volume 12, Number 1) issue of the VEWAA NEWSLETTER. The survey due date was extended through an announcement in the following issue of the VEWAA NEWSLETTER (Winter 1985), which resulted in a total of 106 completed and returned surveys.

This was a disappointing return (less than 7%) given that approximately 1,600 VEWAA members received this survey in their NEWSLETTER. Several reasons for this poor response could be: the length of the survey instrument (three pages); the complexity of the questions that asked for detailed information on client fees, numbers served, instruments used, per cent of job duties, and type of populations served; the fact that the survey was mailed too close to the return date and the deadline had to be extended; and the survey was restricted to VEWAA members, of which only a part are vocational evaluators. There is also concern with this type of survey that those who are willing to take the time to fill it out and return it may not necessarily be representative of the total membership. For this reason, results should not be viewed as conclusive or reflecting the overall practices and needs of vocational evaluators in general.

An analysis of all completed surveys was published in the Fall 1985 (Volume 12, Number 4) issue of the VEWAA NEWSLETTER. Unfortunately, the representativeness of these results to a full-time vocational evaluator position was in question since only 57 of the respondents (approximately 54%) were employed as full-time evaluators. The remaining 49 respondents were employed in jobs that had titles and primary job descriptions related to counselor, administrator/manager, work adjustment specialist, or a combination of counselor/evaluator, director/evaluator, or adjustment specialist/evaluator. To keep the survey focused on the specific position of vocational evaluator, the 57 full-time positions were the only surveys included in this study. Although the sample is quite small, it does provide a unique picture of the vocational evaluator and could be used as a tool in making limited decisions about the state-of-the-art in the field. In addition, these 57 surveys were sorted into three distinct employment settings so that possible trends in similarities or differences among evaluators in traditional vocational rehabilitation, public school, and private-for-profit rehabilitation settings could be studied.

The following data is arranged in the general order questions were listed in the survey and is consistently reported throughout using the following code:

A. Total (all 57 surveys used in this study)

B. Rehab. (traditional vocational evaluation settings - vocational rehabilitation agencies, sheltered workshops, rehabilitation facilities, public hospitals, correctional facilities, institutions)

C. School (school-based vocational assessment programs - secondary public schools, community colleges, vocational-technical school/center)

D. Private (private-for-profit vocational evaluation services - individuals in self-employed private practice, private rehabilitation agencies/companies/centers, worker's compensation, private rehabilitation hospital)

1. Job Title (Vocational Evaluator, Full-Time)

	N	% of Total
Total:	57	
Rehab:	39*	68%
School:	11	19%
Private:	7	12%

*Approximately 74% of this category is composed of rehabilitation facilities and sheltered workshops.

2. Age (Years)

	N	Ave.	S.D.	Min.	Max.
Total:	56	32.5	7.4	23	64
Rehab:	39	32.2	7.8	23	64
School:	10	35.3	7.9	25	51
Private:	7	30.7	3.2	28	35

3. Sex

	N	Male (%)	Female (%)
Total:	56	20 (36%)	36 (64%)
Rehab:	38	12 (32%)	26 (68%)
School:	11	6 (55%)	5 (45%)
Private:	7	2 (29%)	5 (71%)

4. Length of Time Employed as an Evaluator (Years)

	N	Ave.	S.D.	Min.	Max.
Total:	57	4.8	3.5	0.3	15.0
Rehab:	39	4.1	3.2	0.3	15.0
School:	11	7.1	4.5	1.3	14.0
Private:	7	5.1	2.0	2.5	7.8

5. Present Annual Gross Salary

	N	Ave.	S.D.	Min.	Max.
Total:	54	$19,558	5,559	10,416	36,900
Rehab:	36	$17,617	3,989	10,500	32,000
School:	11	$23,656	7,747	10,416	36,900
Private:	7	$23,103	3,467	20,000	30,000

6. State Where Employed (Top Three)

	N	State	(n/%)
Total:	57	North Carolina	(9/16%)
		California	(6/11%)
		Arizona	(4/ 7%)
		New York	(4/ 7%)
Rehab:	39	North Carolina	(9/23%)
		New York	(4/10%)
		Illinois	(3/ 8%)
School:	11	Arizona	(3/27%)

One response each from 8 other states.

Private: 7 California (4/57%)
One response each from 3 other states.

7. Size of Community in Which Employed

	N	Ave.	S.D.
Total:	49	346,827	603,223
Rehab:	33	363,530	706,236
School:	11	212,000	201,859
Private:	7	441,429	396,671

8. Major Referral Sources (Top Three)

	Source	N	% of Caseload
Total:	Voc. Rehab.	46	66%
	Private (Insurance, SS, State Comp., Lawyers, Industry)	34	21%
	Schools	21	43%
Rehab:	Voc. Rehab.	38	73%
	Private	19	14%
	Schools	13	17%
School:	Schools	9	85%
	Voc. Rehab.	5	40%

Five additional referral sources were cited no more than once each.

Private:	Private	5	61%
	Voc. Rehab.	2	98%

9. Major Populations Served (Top Three)

	Disability	N	% of Caseload
Total:	Mentally Retarded/ Handicapped	46	39%
	Physically Disabled	44	32%
	Mental Disorder (Emotionally Disturbed, Personality Disorder, Behavior Disorder, Psychiatric, Psychological)	41	24%

		N	% of Caseload
Rehab:	Mentally Retarded/Handicapped	34	46%
	Mental Disorder	30	26%
	Physically Disabled	25	30%
School:	Mentally Retarded/Handicapped	11	25%
	Learning Disabled	8	50%
	Mental Disorder	6	19%
Private:	Industrial Injury	5	80%
	Physically Disabled	3	63%
	Mental Disorder	1	10%

10. Highest Degree Completed (Top Three)

	Degree	N	% of Total
Total:	Master's	36	63%
	Bachelor's	20	35%
	High School	1	2%
Rehab:	Master's	22	56%
	Bachelor's	16	41%
	High School	1	3%
School:	Master's	8	73%
	Bachelor's	3	27%
Private:	Master's	6	86%
	Bachelor's	1	14%

11. Major Area of Study (Top Three)

	Major	N	% of Total
Total	(Master's Level)	36	
	Rehab. Counseling	10	28%
	Voc. Evaluation	6	17%
	Counseling	6	17%
	(Bachelor's)	20	
	Rehabilitation	3	15%
	English	2	10%
	History	2	10%
	Occup. Therapy	2	10%
	Psychology	2	10%
Rehab:	(Master's)	22	
	Rehab. Counseling	6	27%
	Counseling	4	18%
	Rehabilitation	4	18%
	Voc. Evaluation	2	9%
	(Bachelor's)	16	
	English	2	13%
	History	2	13%
	Psychology	2	13%
	Rehabilitation	2	13%
School:	(Master's)	8	
	Voc.Evaluation	3	38%
	Guidance/Counseling	2	25%
	Special Education	2	25%
	(Bachelor's)	3	
	Human Resources	1	33%
	Special Education	1	33%
	Voc. Rehab.	1	33%
Private:	(Master's)	6	
	Rehab. Counseling	2	33%
	Voc. Rehabilitation	2	33%
	Voc. Evaluation	1	17%
	Education	1	17%
	(Bachelor's)	1	
	Occupational Therapy	1	100%

12. Short-Term Training (Total Hours in 1984, In-the-Field/In-House)

	N	Ave.	S.D.	Min.	Max.
Total:	54	39/12	47/29	0/0	226/196
Rehab:	37	42/14	54/34	0/0	226/196
School:	11	31/8	29/7	0/0	92/20
Private:	7	41/20	20/14	0/0	60/40

13. Payment of NRA and VEWAA Membership Dues (How Much Does Employer Pay?)

	All N / %	Part N / %	None N / %
Total:	20/36%	6/11%	30/53%
Rehab:	12/34%	0/0	25/66%
School:	5/45%	5/45%	1/10%
Private:	2/29%	1/14%	4/57%

14. Type of Certification Held (Top Three)

		Type	N	% of Total
Total:	(55)*	CVE	36	65%
		CRC	13	24%
		None	10	18%
		Teaching	4	7%
Rehab:	(37)*	CVE	21	57%
		None	10	27%
		CRC	7	19%
School:	(11)*	CVE	8	73%
		CRC	4	36%
		Teacher**	3	27%
Private:	(7)*	CVE	7	100%
		CRC	2	29%

CWA, LPC, OTR had one each (14%)

*Many individuals held more than one form of certification, preferably in combination with the CVE.

**Approximately 64% of all respondents indicated that a teaching certificate was not needed to work as an evaluator in their school setting.

15. Number of Clients Worked With at One Time

	N	Ave.	S.D.	Min.	Max.
Total:	57	4.3	3.2	0	25
Rehab:	39	3.9	3.1	0	25
School:	11	4.6	2.2	1	12
Private:	7	6.3	4.3	1	24

16. Number of Individuals Evaluated Per Month

	N	Ave.	S.D.	Min.	Max.
Total:	53	12.4	8	0	80
Rehab:	38	9.8	5.7	0	35
School:	11	19.7	17.4	4	80
Private:	6	18.7	11	6	40

17. Number of Hours Spent by a Client in Evaluation

	N	Ave.	S.D.	Min.	Max.
Total:	53	45.3	97.5	.75	700
Rehab:	35	58.4	119.7	2	700
School:	11	24.5	39.2	1	180
Private:	7	38	52.7	1	200

18. Evaluation Fees

	N	Ave.	S.D.	Min.	Max.
PER HOUR					
Total:	8	$35	19	6	60
Rehab:	5	$27	17	6	45
School:	None Reported				
Private:	3	$50	10	40	60
PER DAY					
Total:	19	$ 62	66	14	300
Rehab:	15	$ 47	40	14	100
School:	2	$161	197	22	300
Private:	2	$ 88	4	85	90
PER CLIENT/EVALUATION					
Total	19	$390	200	150	900
Rehab:	12	$442	204	195	900
School:	4	$252	119	150	334
Private:	3	$515	17	495	525
OVERALL PER CASE					
Total:	29	$ 462	276	21	8,000
Rehab:	17	$ 418	211	21	900
School:	6	$ 681	.981	100	2,640
Private:	6	$1,340	2,376	90	8,000

19. Job Duties

In all settings, report writing and evaluation (administration and scoring instruments) was rated as the most time consuming, most important, and most difficult job duties of the respondents.

Other high ratings under level of difficulty and importance were scheduling, marketing, and staffing, particularly in the rehabilitation and school settings.

Budgeting received a high difficulty rating under the school category.

Case management received a high difficulty rating under the rehabilitation category.

The private category gave high difficulty and importance ratings for administration and a high difficulty rating for evaluation planning.

20. Most Frequently Used Instruments and Techniques

Instrument/Technique	N	% of Total
Psychometric/Standardized Testing	57	100%
-Interest (Top Three) WRIOT RFVII CAI	50	88%
-Achievement (Top Two) WRAT-R ABLE	44	77%
-Dexterity (Top Three) Crawford Purdue Bennett Hand-Tool	41	72%
-Aptitude (Top Two) SRA RMPFB	36	63%
-Intelligence (Top Two) WAIS-R Revised Beta	26	46%
-Multi-Aptitude (Top Two) GATB (USES) DAT	19	33%
-Behavior/Personality(Top Two) WRIPT MMPI 16PF	18	32%
-Other	7	12%
-Work Samples (Top Five) VALPAR JEVS Singer McCarron-Dial VIEWS	55	96%
-Interviewing (Top Three) Intake Exit Feedback	54	95%

Instrument/Technique	N	% of Total
-Situational Assessment (Top Four)	38	67%
Sub-Contracts		
Woodworking		
Janitorial/Maintenance		
Food Service		
-Job Site Evaluation (Top Three)	17	30%
Maintenance		
Food Service		
Clerical		
-Other (Top Four)	16	28%
Behavior Observation Inventories		
Physical/Work Capacities Assessment		
Career Exploration		
Basic Skills Assessment		

The above instruments and techniques are prioritized in the same order for the rehabilitation, school, and private categories.

21. Major Needs as an Evaluator (Top Two/Three)

	Need	N	% of Total
Total:(55)	Training	35	64%
	Equipment	21	38%
	Funding	14	25%
Rehab:(39)	Training	26	67%
	Funding	16	41%
School:(9)	Funding	4	44%
	Research	4	44%
	Training	3	33%
Private:(7)	Professionalism	4	57%
	Legislation	3	43%
	Training	2	29%

22. Major Issues to be Addressed in the Field (Top Two/Three)

	Issue	N	% of Total
Total:(52)	Professionalism	17	33%
	Technology	17	33%
	Certification	15	29%
Rehab:(36)	Professionalism	18	50%
	Certification	10	28%
	Funding	10	28%
School:(9)	Professionalism	6	67%
	Certification	2	22%
	Technology	2	22%
Private:(7)	Legislation	3	43%
	Professionalism	3	43%
	Certification	2	29%

23. What Members Expect from a Professional Vocational Evaluation Organization (Top Two/Four)

	Expectation	N	% of Total
Total:(55)	Training	34	62%
	Legislation (Lobbying)	22	40%
	Publications	20	36%
	Research	19	35%
Rehab:(38)	Training	30	79%
	Research	16	42%
	Legislation (Lobbying)	15	39%
	Publications	15	39%
School:(10)	Publications	8	80%
	Training	5	50%
	Research	4	40%
	Legislation	3	30%
Private:(7)	Legislation	4	57%
	Publications	4	57%
	Training	3	43%

Special thanks are extended to Marsha Andersen, 1985 VEWAA president, for requesting and encouraging this survey; to East Carolina University graduate assistants Elaine Young and Evelyn Sylivant for their tireless help with data analysis; and to the conscientious evaluators who took the time to complete and return the survey. Without their help and support, this survey would never have become a reality.

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WORK HARDENING: A BRIDGE TO RETURN TO WORK

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Abstract

Work hardening is a new and vital concept which continues to gain attention among rehabilitation specialists. Work hardening provides a bridging mechanism for moving the rehabilitation patient into the role of productive worker. The relationship of work hardening to the overall process of vocational rehabilitation is reviewed and illustrated with a case study.

Work hardening is a new and vital concept which in the past three years has captured the attention of a number of rehabilitation professionals committed to assisting clients in their efforts to reenter the work force. Physicians, vocational rehabilitation counselors, special educators, employers and insurance carriers have begun to refer their injured workers to work hardening program. They have begun to view work hardening as an important component in consideration of the client's feasibility for employment.

Without accurate and effective vocational assesment there can be, at best, marginal vocational adjustment (Hardy & Cull, 1969, cited in Maki, McCracken, Pape, and Scofield, 1979). Work hardening can provide the rehabiliation counselor with very significant information regarding the client's limitations, abilities and feasibility for employment. Incorporation of this information into the individualized vocational plan may represent a vital factor in the ultimate success or failure of the client's efforts to return to the work force.

Further, beyond the interests, aptitudes, training and even physical capacities, the client's motivation to return to work enters into the overall successful accomplishment of the employment plan. Frequently, the workder who has been injured on the job has multiple questions to resolve concerning his own capacity to safely or realistically return to previous employment. Economic security coupled with subtle factors such as pain and decreased motivation may contribute to a protracted period of work disability (Greenwood, 1984). At this point, the client struggles with the possibility, then often the necessity of changing his or her lifestyle, occupation, and expectations for the future. Clients at this point are often functioning at a basic survival level.

It is in this phase of the client's struggle that a process of self discovery can begin to take place. Under the guidance of the occupational therapist and rehabilitation counselor, new data, therefore new options, may become available to the client. Often, the client needs to experience for himself in order to learn about his "post-injury self" in relation to work (Stewart, et al., 1984). It is at this point that a period of work hardening can bridge the chasm that develops between the individual as a patient and the individual as a worker.

A model formulated by Maki, McCracken, Pape, and Scofield clearly shows the appropriate positioning of the work hardening program in the vocational rehabilitation process (1979).

Their model is compromised of four components: (1) intake, (2) assessment, (3) services, and (4) outcomes. The rehabilitation counselor handles intake procedures and then turns attention to the assessment component. Here, data concerning current levels of functioning is systematically collected by the rehabilitation counselor. Specialized evaluations may provide information critical to the successful outcome of the client's vocational plan. Work performance assessment and work hardening may be among the specialized evaluations engaged to provide valuable input for the rehabilitation counselor and the client.

During the period of work hardening the client engages in a graded program of progressive exercises which challenge and increase tolerances essential to job performance (Holmes, 1985). The incorporation of simulated work tasks selected on the basis of the client's limitations and the critical demands of the job provides both the evaluator and the client with the opportunity to observe and consider work behaviors and characteristics, client interests and motivation, and pain tolerances. The result of the client's effort in the work hardening experience provides important information for planning further treatment as well as for providding a prospective employer with information that has been verified through observation (Stewart, et al., 1984). Frequently the physician is able to provide the rehabilitation counselor with information concerning a client's limitations based on professional judgment. The work hardening experience, frequently guided by an occupational therapist, extends and validates this estimation of physical capacity. Identification of the client's abilities and adaptive techniques can be translated into functional performance related to the job market based on direct observation.

A key to success in work hardening is the ability of the therapist to tailor the program to the client's abilities and limitations (May, 1984). The occupational therapist can determine the extent to which limiting factors in the client's performance can be reduced or eliminated. Some impediments to performance may be overcome through training in compensatory techniques. Others are eliminated or minimized by the use of adaptive or assistive devices or environments. A key to successful outcomes is close coordination among the occupational therapist, the rehabilitation counselor, and the client. The occupational therapist may recommend and provide alternative methods of minimizing the client's limitations. The rehabilitation counselor may confirm the appropriateness of adaptations with the employer. It is the client, however, who ultimately accepts or rejects any accomodation or adaptation to the job task.

CASE STUDY

Don is a 27 year old hod carrier with a wife and three children, the oldest of whom is eleven. He has worked steadily since he was 14 years old. In November, 1982, while completing his regular work duties, he sustained an injury to his right wrist. Initially, the injury was diagnosed as "tendonitis" and strengthening exercises were prescribed. Later, upon referral to another physician, a diagnosis of "sprain of the flexor carpi ulnaris" was provided. In June, 1983, Don came under the care of an orthopedic surgeon who ultimately excised a tear of the triangular fibrocartilage which had been revealed by arthrogram. Due to persistent drainage, the wrist was re-explored in July for wound debridement, irrigation and capsule repair. When the condition did not improve, Don was referred to a plastic surgeon in October, 1983 who diagnosed "exposed radial ulnar joint" and treated the wrist with intravenous antibiotics and a graft covering of the exposed tendon and joint.

After a period of intensive rehabilitation, the physician judged that the client would be unable to return to heavy manual labor and referred Don for vocational rehabilitation. At the time of referral, the goal was to proceed with vocational exploration, and to determine the client's work potential. Following preliminary meetings with the client, an appointment was scheduled with his treating physician to discuss whether additional treatment might be indicated, specifically biofeedback training to assist with the client's pain.

When the physician provided the specific functional guidelines, plans were made to proceed with direct job placement. Given the extensive amount of time that Don had been unemployed, however, a work hardening program was recommended to (1) test his skills and abilities, and (2) to determine whether the guidelines which the physician had outlined would be permanent, or whether his condition might improve so that he would be able to assume heavier duty work with which he was more familiar.

The initial assessment in work hardening indicated that the client had a number of functional limitations related to work performance. His maximum lifting capacity using both upper extremities was 5 pounds. His maximum carrying tolerance with his right hand was 5 pounds and resulted in significant pain in the wrist. He experienced pain with pushing. Instability of the wrist could be palpated with pulling motions. He had marked limitation and pain with motions of supination and pronation.

Don was assigned to a five day per week, four hour per day program of work hardening which included progressive strengthening exercises and graded simulated work tasks requiring pushing, pulling, lifting, carrying, and wrist pronation and supination. Because the client had lost his driver's license, his wife accompanied him to [illegible] treatments.

Although the client had been told that he would be unable to perform the heavy level work of his preinjury occupation, Don had maintained the hope that he would be able to return to his former job as a hod carrier and laborer. During the period of work hardening,

the client was supported in his efforts to maximize strength and endurance of his injured wrist. Progress was tracked through frequent measures using the Baltimore Therapeutic Equipment Company Work Simulator, Jamar Dynamometer, WEST II lifting device. and the WEST IV torquing test.

By the end of the second week of work hardening, the client and his wife began to acknowledge that objective measures remained essentially unchanged, despite the client's best efforts to improve wrist function. Focus of the program shifted, then, to exploration of compensatory techniques for accomplishing simulated work tasks. A wrist splint to provide right wrist stability was suggested by the occupational therapist to the client, the rehabilitation counselor and the physician. The rehabilitation counselor arranged for the fabrication of the supportive device with the orthotist, based on the occupational therapist's specifications.

In the fourth week of work hardening, as the client tested the use of his wrist splint in simulated work tasks, his level of self confidence seemed to improve. He took initiative in suggesting situations to simulate work tasks. He explored a variety of approaches to task accomplishment. He showed pride in successful accomplishment of tasks he considered most challenging. He took initiative and began looking for work independent of the rehabilitation counselor's efforts. On the final day of Don's four week program of work hardening, his wife accompanied him dressed stylishly and with a new permanent.

Unfortunately, Don's independent efforts to obtain work were unsuccessful. He continues, now, with the rehabilitation counselor's assistance to upgrade his skills. He has completed his high school equivalency test successfully, and is now engaged in a job skills training course in preparation for active job searching in the very near future.

Don's case illustrates the process of validation of the physician's professional judgment and the assignment of specific weights and tolerances for the client's limitations. It also shows the self discovery process through which the client moved in recognizing his limitations and in exploring alternative methods of task accomplishment. In the work hardening setting, this client was forced to use his injured hand. He learned compensatory techniques. A supportive option, the wrist splint, was procured and tested under simulated work conditions. He gained confidence in his capabilities and in his work tolerances.

The work hardening program provided the rehabilitation counselor with information about the scope of the client's abilities. This will enable the rehabilitation counselor to describe to the prospective employer in specific terms, the weights, heights, durations and the compensatory techniques that the employer may expect from his prospective employee in a specific, proposed job. The rehabilitation counselor is now also able to describe to the prospective employer the client's ability to work independently, to report for work on time, to work pleasantly and effectively with co-workers.

This case study illustrates the augmentive role of work hardening in assisting the client in moving from his status as patient and victim of injury into viewing himself as potential worker. This was only one step, but it was a key step, in the total vocational rehabilitation process. The work hardening experience marked a turning point for this client.

For this client, as for many others, the work hardening experience provided a bridge between the client as rehabilitation patient and productive worker.

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"DOWN TO REALITY": ECOLOGICAL DETERMINANTS OF VOCATIONAL EVALUATION

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Abstract

Using a qualitative research approach, the authors examined the ecological factors surrounding the process of vocational evaluation. The study was conducted in six assessment centers serving persons with various kinds and levels of disability. It was found that assessment outcomes were closely associated with intra-organizational and inter-organizational factors and staff ideologies. These determinants served to narrow the focus and scope of evaluation and to provide specific direction for client socialization efforts. Recommendations for reforming evaluation policy and practice and pre-service education were discussed.

Over the years much investigative attention has been given to the content of vocational evaluation, and very little to its context. However, vocational assessment doesn't occur in a social vacuum. It occurs within a complex social environment which itself is embedded within a larger human service delivery system (Dunn, et al, 1975). Thus, it is likely that a variety of ecological factors such as organizational structure, physical-spatial features, intra and inter-agency relations, economic elements, and professional-client beliefs significantly affect the manner in which assessments are conducted, the outcomes which accrue, and the manner in which evaluation participants view and behave within the assessment situation.

In two recent reviews of the assessment literature, Berven (1983), and Sherman & Robinson(1982) indicated a need for investigators to focus more intently on the contexts within which evaluations of handicapped persons occur. This study represents an attempt to build upon the earlier work of Murphy & Ursprung (1983), and to examine the ecological determinants of vocational assessment.

Method

The investigation relied on two qualitative research techniques: participant observation and semi-structured interviewing. Six evaluation centers serving persons with disabilities in Upstate New York were selected for study. The selection criteria was their geographic location and the different clientele they served. Three of the six evaluation centers were located within urban environments while three were located in small cities and served rural populations.

A series of participant observations and semi-structured interviews were conducted over an eight month period at the six centers. A total of 43 visits were made which amounted to about 145 hours of observations and interviews. During that period 26 clients received vocational evaluations. Observations were made at different hours of the day, different days of the week, at various settings used within the centers, and at various stages of the assessments. Interviews were held with 34 different individuals who were part of the assessment program, including 22 clients, 5 administrators, and 7 evaluators.

Field notes were analyzed using a constant-comparative, emergent theme approach (see Glaser & Strauss, 1967; Schneider & Conrad, 1985), in which line by line analyses of field notes were made by the researchers who formulated themes as they conducted their study. These themes were placed on index cards, and beneath each theme were observations and quotations which reflected those themes. Every observation and quotation was assigned a theme and placed on a coding card. A total of 75 themes were developed. As coding categories and themes emerged, observations and questions in the field became more directed toward these

themes. Thus, as the study progressed, the observations and questions of the researchers became more focused.

The researchers independently collected and analyzed field notes and interview data for three centers, and came together at the end to combine their themes into one set of results which are represented by the major themes in the Results section of this article.

Evaluation Center Types

The terms vocational assessment and evaluation will be used interchangeably in this paper to refer to the process of measuring an individual's potential for employment using a variety of methods, but characteristically through the observation of behavior in work-related or work-like activities (Gannaway & Wattenbarger, 1979). In the current study all of the evaluations were conducted in assessment centers which were located within a host agency that served as a kind of umbrella organization. The relationship between the center and its host agency followed one of three types of schemas: 1. the vocational services assessment center; 2. the quasi-independent center; and 3. the school-based center.

The vocational services center was a standard model for providing assessments to mentally retarded and mentally ill persons, and for conducting assessments in rural areas. Four centers, which we will call East, West, North, and South, fell under this classification. Within this model, evaluations were conducted within the context of a sheltered workshop/work activities facility. North served persons labelled mentally ill, was located within an urban setting, and operated as part of a sheltered workshop program attached to a large, residential institution. The other three were located in small cities, and all were the major sources of vocational services for mentally retarded persons, and most other disability groups in their geographic area.

The second type of evaluative model in the study consisted of an assessment center located in an institution which offered very few other services for persons with disabilities, or which clearly separated the other services physically and socially from the evaluation center. This type of host facility might be a university, hospital, or adult education program. Central Center fell into this model. Within this model the clients had relatively mild physical and/or emotional problems, and once evaluated, generally moved on immediately to some other program.

The third model was a school-based model in which assessment was conducted for selected students within the school district who had physical and/or mental disabilities. This model was represented in the study by an assessment program in which ninth and tenth grade students, referred by their home schools, were bussed to a center and placed in exploratory classes such as food services, automobile maintenance, building trades, cosmetology, etc. After their class they were bussed back to their home schools where they resumed their regular academic schedule. They followed this schedule for one academic year, switching the type of class they attended every six weeks, and receiving a formal assessment sometime during that year in addition to the assessments provided by the instructors in their various classes. At the end of the year all of the instructors and the evaluator met to discuss each student and decide where he/she would be placed for the following year. The students in the school model were described as learning disabled, mentally retarded, or emotionally disturbed.

The evaluator's credentials varied considerably between agencies. Each agency employed one evaluator except Central, which had three. West Center's evaluator had a Bachelors degree and ten years experience; South and East evaluators had Masters degrees in Counseling and Guidance; the staff member at North had a Masters degree in Vocational Evaluation and Work Adjustment; the School Center employed an evaluator with a Masters degree in Special Education; of the three evaluators at Central, two had Masters degrees in Rehabilitation Counseling, and the third had a Masters degree in Vocational Evaluation and Work Adjustment. All of the evaluators claimed to have had additional credentials and experiences such as in-service, staff development, and professional workshops in vocational assessment, and specific curricular concentrations in testing and/or measurement.

Results

Predictability of Assessment Results

Perhaps the most consistent finding across all the settings was the predictability of the assessment outcomes. Except for one assessment facility, nearly every client who underwent assessment in a given facility was recommended for training or employment in that facility. Individuals who were evaluated in centers attached to sheltered workshops, were invariably placed in the workshop. Persons assessed in a school-based program were consistently referred to one of several vocational training classes, or back to their home school. This outcome occurred irrespective of evaluator credentials, work experience or education, irrespective of evaluative materials used and despite demonstrated client abilities, and interests.

Such an outcome might be explainable if the stated goals of evaluation were to screen persons to enter a workshop. However, such a goal wasn't evident in the materials provided by the facility to describe their program. Each of the centers had published, formal goals which were quite similar. As described in the South Center materials, the assessment services were designed to: 1. gain a better understanding of personal abilities, capacities, and potential; 2. develop realistic vocational aspirations and goals; and 3. identify a goal attainment plan.

The program goals inferred that evaluation would lead to a vocational plan, and that the vocational recommendation would reflect the results of the assessment. On the surface this presumption appeared to be operational since all of the placement recommendations appeared to emanate logically from the evaluation process. Ecologically, however, there appeared to be very different forces operating on evaluation and placement recommendations than client characteristics, and/or community service opportunities and/or job markets.

Intra-Organizational Forces

Within the vocational facility model the asses-

sment functions of all the centers were closely tied to other intra-organizational rehabilitation services, namely, work adjustment and training, and/or sheltered employment. The assessment, though conducted separately in a designated area, was intimately tied to the sheltered organization in that the staff members were employees of the same organization, clients were always placed in the workshop as part of their assessment experience, client transportation and attendance schedules were virtually the same, and lunch and breaks were taken at the same time and in the same places.

It was common for the type and scheduling of situational assessments to depend upon the production demands of the agency's sheltered workshop. If an important contract was received, evaluation clients underwent situational assessments sooner, and for longer periods, coinciding with the contract period. If work was slow in the workshop, situational assessments were minimized, or involved make-work materials.

Within the assessment room itself, it was common for evaluators to assign clients to in-house work samples that were either previous workshop contracts, or were developed from past contract materials. Therefore, a great deal of the information collected on client behavior reflected their performance on workshop jobs and activities. In fact, in all of the centers studied, a high priority was placed on collecting information on client productivity consistent with the workshop's wage and hour reporting. Thus, much behavioral information was collected and reported in terms of an individual's ability to fit into the existing workshop environment.

The Central Center offered work adjustment services in addition to their assessment program. About 25% of the clients were referred to the work adjustment program, far less than the percentages referred to the intra-organizational services of other centers. This may have been due to the relative independence of this center; also to the fact that the center served a wide variety of clients for whom such work adjustment services were thought to be inappropriate by the referring counselors, evaluators, and the clients themselves. This referral policy was underscored by the fact that there were virtually no staff available to supervise in-house work adjustment, and the host institution was reportedly not supportive of such a program on a large scale.

The School Center referred all of their evaluatees to classes within the pre-determined, school based vocational program. The decisions to place an individual in a particular class was based primarily on the student's stated interest and an instructor's willingness to accept him/her, especially the latter. Several students were recommended for placement back in their home schools because no instructor would accept them, even though the students expressed interests which coincided with existing classes. In numerous instances students expressed vocational interests in areas which were not offered by the school, and would have required a placement in a community work site, something the school was not equipped or willing to do. In short, the assessment data appeared to be clearly secondary to pre-existing professional expectations and program expediency.

In all of the centers studied it was not surprising that the evaluator so infrequently recommended community placement for their clients. As they noted, there was almost no one to carry out such recommendations. The vast majority of staff at the agencies were involved in in-house programming, and very few had regular, sustained contact with community employers. The individuals who had the most such contact were the contract procurers whose job it was to bring work into the agency, not place people out in the community. Resources devoted to analyzing the community labor market, developing community work sites or competitive jobs, and/or supporting clients in work outside of the center were relatively few. In fact, of the six agencies studied, only two had full-time placement specialists; two didn't employ a placement specialist, relying on other agencies to do placement, one had a half-time position which was reportedly filled by a person with other full-time duties, and one position was vacant, and had been for several months. In short, many intra-organizational factors mitigated against a community placement recommendation unless the evaluator was willing to do the placement him/herself.

Inter-Organizational Factors:

The relationship of primary importance to the assessment center was that of the referring organizations and their representatives. In five of the six agencies studied, this was the state vocational rehabilitation agency (OVR), an organization upon which the centers were financially dependent. OVR was not only the major source of evaluation referrals, but also was the major contractor for vocational services after evaluation. Evaluators took their instructions from VR counselors; it was to these individuals that evaluators were primarily accountable, not their clients. Clients had little or no say in how the evaluation was structured, had no choice in where the assessment was conducted or who the evaluator was, and frequently had no specific idea about why it was being done, or in what specific ways the information was to be used. Several clients when asked why they were being evaluated replied that "it was part of my program", that "it was to see what work I can do", that it "was to find out where my strengths and weaknesses are", or that it was "to measure if I could go to college or not".

In contrast, referring counselors communicated in written and verbal form the specific reasons for the evaluation, and the particular questions the evaluator should answer. All of the evaluators reported that they looked for cues from the referring counselors and would modify the assessment to conform to their requests. As one evaluator noted: "(referring agency) wants the information, and they are the ones that are buying services, and they want something in return".

In many cases the counselor's wishes did not have to be explicitly stated, but were inferred by the way in which a referral was made. For example, in one situation when the VR counselor failed to specify that competitive outcomes were to be considered, it was taken as a "green light" for a sheltered closure. When competitive employment was a counselor preference, evaluators reported that more justification was required in the evaluation report for a sheltered recommendation.

Most of the agencies had a clear financial in-

centive for keeping clients as long term employees of the agency. Both state and local funding was available on an ongoing basis, but only if the agency retained the clients in the workshop program. In addition, client employees earned contract income for the agency, and evaluators were keenly aware of these financial realities as they applied to their activities. As one evaluator observed: "There is no where else (to refer clients). If I did that though, the bosses would be pretty upset. They'd probably say I'd be taking away their bread and butter".

It should be noted that the relationship between evaluation centers and referring agencies under the conditions described above was one of mutual dependence. Certainly the assessment centers needed funding. However, OVR needed placements, and had neither the manpower or money to attain them unassisted. Thus, they could not press their interests beyond a certain point since in many of the communities studied, there was an absence of any evaluative or placement alternatives.

The one agency which was not dependent on OVR for referrals was North which obtained their clientele from the large residential facility of which they were a part. This center seemed self-contained and insulated from inter-agency influences and pressures.

Staff Ideologies

Evaluators believed that they were discovering and making recommendations based on real intrapsychic traits of their clients in an objective manner. They also felt that whatever gaps existed in their technical measures was filled by their ability to assess client motivation - a key ingredient in predicting vocational potential. As one evaluator noted, "...commitment to a program of evaluation and training that would lead to employment (involves) two things really: 1. motivation to work; and 2. motivation to the rehabilitation process... We have to find out what's motivating the person... if you don't know what's motivating the person, he may tell you one thing and do another."

They believed that the ultimate goal for each client was community employment, and that their assessments helped clients toward that goal. However, they also believed that most of their clients were low functioning and unemployable in the competitive world. The primary needs of their clients were thought to be: a) a structured program; b) protection from failure; and c) protection from stress. They believed that clients should start out on simple, undemanding tasks in very restricted settings until they "do well" or "prove themselves".

Much evaluator-client interaction was designed to channel a client's vocational aspirations towards the small number of options prescribed by the agency. Whenever possible a client was recommended to which ever in-house option was thought to most nearly match his/her needs, even though that match might be remote. Clients who did not readily accept workshop employment or other training or employment suggestions, were "counseled" concerning the wisdom of the option, its proximity to their expressed interests, and/or the unrealistic nature of other alternatives. Evaluators called this process "bringing clients down to reality" or helping them "make realistic choices". At times this evaluator response seemed unconscious, such as when he/she responded to an "unrealistic" client statement by remarking "let's put a question mark by that one". Another way of dealing with such a situation was to refer to a number of alternatives but never specify any of them except the desired one, or leave the others vague. Clients who persisted were often presented the possibility of no services, though this action was viewed as much less desirable than a negotiated decision. Some clients resist being congregated with large numbers of other disabled people, and specific desensitization strategies are employed during evaluation to reduce or eliminate resistance. The personal influence of the evaluator is used to insure that such clients learn to "fit right in".

To a great extent staff ideologies appeared to be maintained by professional and organizational isolation from the community and from innovative programs occurring elsewhere. There were few challenges to the evaluators recommendations that a client's behavior would not be acceptable in competitive employment, because no one: 1. worked closely with community employers; 2. was cognizant of programs which proved otherwise; or 3. were involved with other professionals who saw things differently. Thus, the four or five alternatives offered by evaluators were presumed to represent a realistic appraisal of client employability, and of local occupational opportunities.

Since resources were directed overwhelmingly towards in-house programming, there were no support services available for community placements, and the only type of placement considered was that which required minimal/short term on-site assistance. The prophecy that only the high functioning client could work became the self-fulfilling rule of thumb. When discrepancies between officially stated goals and actual practices were pointed out, they tended to be excused as temporary anomalies no matter how frequently or consistently they were observed.

Client Perceptions

The backgrounds, experiences, skills, and vocational goals of the clients in the study were rich and varied. Many individuals had multiple problems, minimal education and work experience, and difficulty with the routine tasks of everyday life. However, many others lived independently, were married, and did their own budgeting and shopping. Many used public transportation without assistance, and had held competitive jobs. In fact, one individual was holding a part-time job at the time of his evaluation, which, incidently, recommended sheltered employment. Despite such diversity all of the clients in each center received virtually the same evaluation. In some cases where people couldn't read or were obviously not responding to the tasks at hand, paper and pencil tests were omitted. However, all clients received the in-house work samples and were placed in situational assessments within the agency setting. In many instances such placements were clearly inappropriate and neither reflected the individual's skill level or interests. In one instance, a young woman who had 21 credits of college was assigned to a jig designed for persons unable to count to 100. In another situation a young man who wanted

to be a carpenter and who had a year of college was assigned to sand wood. None of the clients in the study were assessed within a community setting at any time, even though the vast majority expressed a desire to work in "real jobs".

Within the Central Center the situational assessments were conducted in real work settings within the host institution. However, clients were placed in those situations for only half of a day, far too little time to demonstrate any level of competence or to get a good sense of what was involved in the job. The evaluators were dissatisfied with this arrangement, and frequently requested that the on-site supervisors provide more time to the disabled evaluatee. However, often the supervisors were resistant to assuming these duties and were neither paid nor trained to conduct such training. According to the evaluators at Central, when the on-site supervisors did extend the time for the situational assessment, they often relegated the clients to some peripheral activity.

Summary

It certainly appeared that ecological factors profoundly affected the vocational assessment process, determining how evaluations were conducted, outcomes which accrued, and staff ideologies toward their clients and service priorities. Despite the belief that evaluation is an objective, impartial process which assists clients in expanding their options and achieving community employment, there is evidence to suggest that assessment outcomes were determined by organizational needs, the impact of evaluation environments on client behavior, and staff ideologies. The primary objectives of assessment appeared to be: a) to acclimate and socialize clients into a predetermined employment framework, most frequently segregated; and b) provide the practice of sheltered services with an aura of legitimacy and scientific respectability. It should not be inferred that evaluators favor segregated, sheltered services. Rather, the entire system surrounding the assessment process is so organized around this service model, that it is virtually impossible to circumvent, except in those instances where evaluation centers maintain considerable independence, where clients are sufficiently well versed and/or assertive, or where referring professionals do not favor such alternatives for specific clients.

Recommendations

The following recommendations are intended to address the ecological imbalance which favored a restrictive, segregated orientation toward employment and led to assessment recommendations consistent with this orientation.

1. Evaluation should be conducted independently - apart from an agency with vested interests in the outcomes. If such agencies conduct assessments, they should clearly label them screening devices specific to the agencies and not generic appraisals.

2. Evaluators need to be more accountable to clients regarding both the specific purpose of the assessment, the recommendations, and the rights of the individual undergoing evaluation.

a) Before the assessment clients should be provided a written statement indicating very specifically, the reasons for the appraisal, the specific ways in which the information will be used for decision making, and the role the client, parent, or advocate should play in the process.

b) Vocational evaluation reports and outcomes should undergo periodic review by an impartial, independent body. Community review boards should be established by local governments to review randomly the files of all agencies serving persons with disabilities, and to make recommendations for change at whatever levels are necessary; these boards should be comprised of professionals, parents, advocates, and disabled consumers, to examine evaluation reports, and to conduct follow-up reports of individual clients. The board would also be available to hear appeals and concerns of parents, disabled persons, advocates, and professionals, functioning in much the same way as Boards of Visitors do for residential institutions. Currently, no such bodies exist for OVR, not-for-profit private agencies or for profit making organizations.

c) Specific procedures should be delineated concerning the dissemination of recommendations to clients and counselors. Such things as how the recommendations were formulated, what information was used and considered most important, who will have access to the information, and what the client's rights are in developing and approving the final recommendations should be spelled out and operationalized.

3. Evaluators and evaluator educators need to become far more active in reforming the way in which vocational assessments are conducted. Certainly they should assume far more leadership in acting on the preceding recommendations. Beyond this, however, they need to address a number of other important issues at both national and local levels:

a) They should make a commitment to teaching and providing least restrictive assessments and recommendations. There should be a moratorium placed on the use of segregated, highly restrictive settings for situational assessment. Community job tryouts should become as integral a part of the assessment process as are work samples, and recommendations for sheltered placements should be viewed only as a last resort. The specialty of evaluators should become the vocational integration of even the most severely disabled persons into mainstream society. This goal would require that evaluators spend as much time assessing community vocational situations as they do conducting person-centered evaluations.

b) Educators of evaluators should go beyond a person-change orientation and provide their students with the professional philosophy and skills which can address the ecological variables that will affect the work of practitioners, can maximize their professional autonomy through community organization, and can assist them

in assuming positions of leadership in providing and developing least restrictive, community-based services.

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COMPUTER ASSISTED REPORT PROCESSING IN VOCATIONAL EVALUATION

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Abstract

Computer Technology can be utilized within a vocational evaluation setting to enhance vocational potential, administer standardized assessments and perform routine management functions. In the area of management, computer assisted reporting seems to be an attractive alternative to often cumbersome hand written or dictation methods. Many commercial manufacturers of vocational assessment tools are now providing computerized reporting as part of their sales package. In addition, there are generic evaluation reporting systems which incorporate information from a diverse range of standardized assessment techniques. Often aiming to meet the evaluator's needs, the "complete" report seems to lack items essential for a quality, professional product. Many evaluators are adapting word processing packages to meet their own professional needs. There are pros and cons to all of these computer assisted reporting methods. This paper addresses specific selection criteria and essential components of computerized vocational evaluation report processing.

The intent of this paper is to present an unbiased opinion of some pro's and con's inherent to computer assisted report processing. This concern crosses the boundaries of both rehabilitation and school based evaluators as products are often applicable in both settings. The discussion of these issues are offered herein from a practitioners standpoint.

Computer Applications in Vocational Evaluation

Computers can be integrated into a vocational evaluation program in a number of different ways. According to most employment forecasters, computer literacy will most likely become a universal requirement of the future work force. Thus, keyboarding skills, as well as computer literacy in general, need to be addressed within the vocational evaluation process (Botterbush, 1983).

Through the use of adaptive peripheral devices, the computer can be used as a means to enhance the vocational potential of individuals with severe physical or sensory disabilities. Jobs which once were considered out of the range of many severely disabled individuals can now be performed after technological adaptations are made.

Computers can also be utilized to administer commercial assessment tools. This type of administration ensures standardization as well as objectivity on the part of the evaluator, since generally both administration and scoring of the assessment data is handled by the computer.

Computers can also be utilized in a number of ways in the management of vocational evaluation services. They can streamline processes in record keeping, budgetary planning, scheduling, form development, worksample norming, and report writing.

Computer Assisted Evaluation Report Processing

Increased needs for vocational evaluation services have placed extra demands on the professional evaluator. For school based evaluators, the Carl D. Perkins Vocational Education Act (P.L. 98-524) mandates increased vocational evaluation services and resulting reports. Rehabilitation evaluators face a similar challenge with the large service demands placed upon them in terms of both private and disability determination evaluations. The increase in expert witness testimony requires thorough documentation of evaluation processes and results. As the final written report summarizes the complete professional service, it is vital that this be a quality display of the professional skills of the evaluator. The computer can be instrumental in assisting the evaluator in displaying those skills.

Vocational Evaluation Report Content

Guidelines for vocational evaluation report content have been addressed in both rehabilitation and school-based literature. Regardless of evaluation setting, the content components of a vocational evaluation report are generally agreed upon. These components include identifying information (demographic data, disability description, background information, etc.), reason for referral, general impressions and observations, list of assessment instruments, analysis of results, summary and interpretations, and recommendations (Esser, 1974; McCray, 1982).

The structure of the report format determines how well the report fulfills writing principles as well as addresses essential content areas. Vocational evaluation reports should serve to inform, meet the reader's needs, clearly present an accurate and objective picture, while saving the reader's time (Esser, 1974). Reporting problems may arise due to the reporting format, evaluator's writing style or evaluator's level of expe[illegible]e examples of these problems inclu[illegible]o long or too brief), use of infor[illegible]ng informa-tion, and failure to doc[illegible]Esser, 1974). To decrease reporting pro[illegible]portant to carefully consider the [illegible]e report, whether computerized [illegible]

Types of Computer Assisted [illegible]ation Rep[illegible]t Processing Programs

The computer software available for report writing falls along a continuum according to scope---the type and number of evaluation tools which are addressed by the program. However, three basic types of reporting programs can be considered. There are computerized reports related to a particular assessment system, generic reports which include a number of assessment systems, and word processing which allows integration of any number and type of assessment tools or systems.

Many manufacturers of vocational assessment tools now provide computer assisted reporting as part of a total sales package. MESA, Apticom, McCarron Dial, VASCO, and MECA are all examples of computerized reporting programs designed for a specific assessment system. Most often these programs score the assessment and present the results in a standard format. Comment sections are generally provided for the evaluator to interpret the assessment results.

Because most evaluation units use a combination of evaluation tools, generic reporting programs which address a range of assessments are often more practical. Voc Report and Comport 19 are two examples of these generic reporting programs. Comport 19, which is produced by Valpar International, includes evaluation planning as well as report writing within their comprehensive package. Both Voc Report and Comport 19 allow the evaluator to select from a varied menu of commonly used assessment tools and integrate them into a final report. Most generic reporting programs do not easily allow additional tools to be integrated into the reporting format.

Word Processing is the third type of computerized reporting program. Commercial word processing programs can be used by the evaluator to tailor a report to the specific needs of the vocational evaluation unit. The report can thus address all of the assessment tools and techniques used within that particular setting. There are two basic ways information can be input into a word processed vocational evaluation report. Information can be keyed directly into the report format or it can be merged into the report from a data base or filing system. This data base could include biographical information about the client as well as statistical data about his/her test performance. In addition, the data base can serve as an information pool for regional worksample norming and information collection. In a word processed vocational evaluation report, comments can be entered to interpret the test results. Report sections are easy to access and amend using this technique. Word processing, because of its flexibility, allows a great deal of descriptive information about the assessments to be standardly included within the report.

Selection Considerations

When purchasing a computer assisted reporting program, a number of considerations related to the evaluation setting in which it will be used need to be taken into account. These considerations include flexibility, scope, description, focus, page line up, length, comment capability, saving ability, time effectiveness, set up time, ease of use, cost, guarantee, and technical support. Although all of these factors should be considered, the relative weight of each will, of course, depend upon the setting.

Flexibility

The program must be sufficiently flexible to meet the specific reporting needs of the evaluation setting in which it will be used. It must present information in a format which is suitable to the evaluation setting. Not only must it be able to meet those needs at the time of purchase, but it should also be able to meet those needs in the future should changes in the evaluation process or system take place. These can include a change in the referral agent's specific needs or an actual change in the evaluation service delivery.

Scope

The scope of the reporting program should include all the tools which are used within the evaluation setting. There should also be the ability to integrate additional tools should others be purchased or developed.

Description

Contained within the report should be a description of the assessment tools and techniques, the rationale for administration and a description or interpretation of the assessment results. The description enables the evaluator to make the information clear to the reader.

Focus

Related to the amount of description included within the report is the focus of the report. It

should be written with the intended audience in mind. The final report of many commercial reporting programs contains only a number or percentile score along with the name of the assessment or subtest. Little additional information is provided. This is not sufficient information to make the evaluation results clear to most audiences. Additional information can most often be included within the comments section, however, it is not an efficient use of time to input a relatively standard description of the assessment tools in each individual report.

Page Line Up

The professional appearance of the final document must be considered. The print out should line up on regular 8 1/2" x 11" pages with even top, bottom and side margins. In addition, the style of the type should be suitable for a professional document.

Length

The length of the report should be neither too long nor too brief and should contain information essential to communicate the client's performance to the intended audience. Ideally, the length of the report should have the potential to be controlled by the evaluator.

Comment Capability

The report should allow sufficient room for comments to make the necessary interpretation of assessment results. The comment sections should allow the evaluator the flexibility to edit and change the report information easily.

Saving Ability

The reporting program should allow the evaluator to save the report to disk in order to be edited or completed at a later time. It is rare, given the demands of the vocational evaluator, to be able to complete an entire report in one writing session.

Time Effectiveness

The time needed to process the report should be short, or at least shorter than traditional handwritten or dictated methods.

Set Up Time

The initial investment of time for set up of the program should not be excessive. Commercial packages generally require little set up time, whereas word processing requires a great deal.

Ease of Use

The reporting program should be easy to use or "user friendly". It should not have bugs (problems) which result in error messages or lost information. The various sections of the report should be easy to access in order to add or change information.

Cost

The cost of the program itself must be considered, however, each evaluation setting must take into account the total cost (staff hours) of the time required to set up the program. With word processing programs, this set up cost may in fact exceed the actual cost of the program.

Guarantee

A replacement guarantee is beneficial should something happen to the software. This should be considered prior to purchase rather than when it is needed.

Technical Support

The technical support which is provided by the company is important. Ideally, a consultant should be available for set up of the program and for problem solving once the program is in use. Short term training sessions should be available for the evaluator's introduction to the software program.

Conclusions

Computer assisted report processing appears to offer an easy solution to the vocational evaluation report writing dilema. There are, however, many factors to consider in the selection of a computer assisted report processing program. The relative pro's and con's of the reporting programs should be debated by each evaluator, dependent upon the specific demands of the evaluation setting in which he/she works.

Evaluators should seek to maintain ownership of the critical components needed within a vocational evaluation report, to ensure its professional content. As the ultimate professional responsibility of the report rests in the hands of the evaluator, so should the control of the reporting process and product.

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A CRITIQUE OF THE RESEARCH DATA BASE RELATIVE TO WORK ADJUSTMENT

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ABSTRACT

In this paper it was argued that the professional activity of vocational evaluation and work adjustment in rehabilitation, having evolved as a multi-disciplinary entity drawing heavily from psychometrics and behavioral psychology, now finds itself in the middle of a paradigm crises. Since general systems theory evolved as a solution to similar paradigm problems in the physical and biological sciences, the perspective was applied to some of the long-standing research problems in the field of work adjustment. It was suggested that a more holistic view of human behavior would eliminate many of the pseudo-issues that presently divide us into "warring factions."

Social and behavioral science research which is potentially relevant to the human services is accumulating at an astronomical rate. Paradoxically, widespread feelings of helplessness, frustration, cynicism, and burnout are becoming more and more characteristic of human service workers (Ursprung, 1986). Practitioners are not getting as much help from research as we might wish and the problem appears to go deeper than just the lack of adequate research utilization practices within the human services. Much of the existing research is based upon world views that no longer fit the terrain. The accumulation of bits of information which make up the research literature do not, in and of themselves, provide a frame of reference for comprehending or using the information.

One reason for this is found in the revolutionary changes that are evolving across many disciplines. A mechanistic, reductionistic, and dualistic frame of reference for scientific thought is giving way to an organic, holistic, evolutionary view. Newton and Caple (1985) observe "a paradigm shift is taking place," and Tiller (1979, pp. xiii-xiv) points out that "Humankind's view of itself, of the universe, and of the synergistic interrelationships of both is in for great changes." In a similar vein, Richard M. McFall (1986), arguing for broadening the traditional behaviorist view characterized science as being basically revolutionary in nature. In his view, the behavioral movement gradually replaced one orthodoxy with another and thus set the stage for the next scientific revolution.

As a relatively new professional group in search of a technology, we have borrowed most heavily from the disciplines of psychometrics and behavioral psychology. The central concern of psychometrics is the study of personality and individual differences while the central concern of behavioral psychology is the development of a technology for managing behavior.

For a long time these two special interest areas in psychology developed independently of each other and from other subdivisions of the sciences and human service professions. The psychometric study of personality, because its methodology was limited to discovering individual differences, lost track of the common observation that people are a lot more alike than different. The behaviorist orientation, through its search for principles that applied to all organisms, lost track of the role of the individual in shaping behavior.

The evolution of scientific thought is now offering us a new paradigm, a new vision of reality in the form of general system theory which integrates all previous dualisms such as mind-body, structure-process, and objective-subjective reality. The practical consequence of this shift is that "the human person must be viewed as an integrative whole involving interdependent

physical, psychological, social and cultural patterns." (Lucas, 1985, p. 170)

This shift can be seen in the evolution of the work adjustment concept toward career development, the recognition of problems with traditional interpretations of job satisfaction, job performance, and stress, and the emergence of more holistic views of client adjustment. Nevertheless, confusion in the field continues to undermine utilization of these concepts, and practice at the service-delivery level is slow in reflecting these changes.

The Shift From Work Adjustment to Career Development

Although the ground for "work adjustment" could potentially be the entire employment-unemployment continuum, historically, concerns about work adjustment have evolved as a reaction to unemployment, and attributions of the cause of unemployment range from completely within the person to completely within the environment. The term "work adjustment" first evolved within rehabilitation to designate a particular intervention whereby structured work activity was used as a therapeutic agent to treat inadequate work habits (Dean, 1972). This limited meaning, however, became eroded as the term began to be used to refer to characteristics of the individual as in the Work Adjustment Rating Form (Bitter & Bolanovich, 1970) or the Minnesota Theory of Work Adjustment (Davis, 1976). When the cause of unemployment is attributed mostly to individual, the terms work adjustment, personal adjustment, vocational adjustment, or occupational adjustment are often used synonymously.

As the disability service delivery system integrates the developmental concerns of habilitation with traditional rehabilitation and transforms the medical model to a developmental, skills-training model, the concept of career development is beginning to be used as an alternative to the concept of work adjustment (Akridge, 1985). Career development is a more positive term which subsumes the human attributes of both employability skills and vocational adjustment problems and is broad enough to encompass the entire continuum of employment-unemployment. The perspective of "career development" combines the issues of socialization and self-actualization over the life span of the individual and is easier to share with the client than are such terms as work adjustment and vocational evaluation. Persons who are struggling with disabling conditions don't frequently seek us out to get evaluated and adjusted. They want jobs (or career development).

Problems with Interpretations of Research on Job Satisfaction, Job Performance and Stress

Though job satisfaction and job performance may be defined and measured in many different ways, the relationship between these two variables has been one of the most widely researched topics in the work adjustment literature. Iaffaldano & Muchensky (1985) reviewed this literature and published the results of a meta-analysis on a selected sample of 74 studies which concluded that job satisfaction and job performance are only slightly related and that interventions designed to increase one should not necessarily be expected to increase the other.

On the other hand a growing body of evidence suggests that occupational stress is causally related to physical illness, psychological impairment, and lowered job performance and satisfaction (Cooper & Marshall, 1976; French & Caplan, 1972; Margolis, Kroes, & Quinn, 1974). A more holistic perspective, guided by the principles of general systems theory, would lead one away from the pseudo-question of causality between job satisfaction and job performance to the task of making explicit (understanding) the mutually influencing dimensions and levels of the self-in-situation system we call worker. Job performance, job satisfaction, and job dissatisfaction (stress) are all important subsystems of a larger whole, but do not necessarily have a strong causal relationship with each other.

Stout (1984) incorporated this distinction in his study of supervisor structuring and consideration on rehabilitation workers' job satisfaction, stress, and health problems. Higher job satisfaction was found among workers whose supervisors were high on consideration regardless of their level of structure. Lower stress was reported by workers whose supervisors were high on both structure and consideration and more health problems were reported by workers whose supervisors exhibited high-structure and low-consideration. Unfortunately the study did not include a measure of job performance. Consistent with Schuler (1982), burnout, as reflected by health problems, was conceptualized as the result of prolonged, intense, unresolved stress, while the negative effects of stress may be buffered by various sources of job satisfaction such as social support or commitment to the organization.

The study of stress as a multi-dimensional phenomenon has added much to our understanding of work adjustment. Stress has been studied from the standpoint of person variables such as self-efficacy (Bandura, 1982), hardiness (Kabasa, Maddi, & Kahn, 1982), and coping skills (Cohen & Lazarus, 1979), environmental variables such as social support (Cohen & Wills, 1985), and various person-environment fit variables (Chemers, Hays, Rhodewalt, & Wysocki, 1985; French, Doehrman, Davis-Sacks, & Vinokur, 1983). This diversity of perspectives also highlighted the need to question traditional research paradigms.

For instance, Baker's (1985) review led him to claim that "From a public health perspective, the key issue in the study of stress at work is whether the etiologic dynamics of stress are to be found within the workplace or within the worker (p. 367). In contrast to the person-environment fit model which reflects a clinical perspective of stress as a psycho-physiological phenomenon that arises from an individual's perception of an imbalance between environmental demands and response capabilities, Baker favored the Job Demand-Control Model proposed by Karasek (1979). This model characterizes types of jobs and individual workplaces as high or low in job demands and in decision latitude. Both high demand and low decision latitude are related to occupational stress, and their interaction is particularly predictive of high strain. This brings us back to the person-situation debate and the search for a paradigm that transcends the polarity.

Person-Situation Debate

Epstein and O'Brien (1985) provided a comprehensive review of the literature relevant to the question, "To what extent is behavior situationally specific, and to what extent are there broad generalities in behavior?" The field of personality, from its beginning, involved a division between those such as Allport (1931, 37) who viewed behavior as centrally organized and purposive, and other such as Thorndike (1906) who viewed behavior as mechanistic and composed of discrete habit elements. Allport's interest in an idiographic approach which emphasized the unique organization of variables within the individuals led him to abandon the effort to establish broad general traits to those personalogists who were committed to the normative methods of psychometrics.

Mischel (1968), carrying the banner for the behaviorist position, came out with an influential book that marshalled the various arguments and evidence against a trait position. One major source of evidence consisted of low correlations between objective (non-self-report) measures of the same trait. A second source of evidence consisted of findings that cast doubt on the validity of self-report measures and clinical assessment procedures. The failure to adequately take into account method variance (Campbell & Fiske, 1959), social desirability and response sets (Edwards, 1957), and construct validity (Cronbach & Meehl, 1955) in devising and validating measures of traits was emphasized. Additionally, a series of studies by Endler, Hunt, and their associates (e.g., Endler & Hunt, 1966, 1968, 1969; Endler, Hunt, & Rosenstein, 1962) demonstrated that the amount of variance accounted for by situations and person-situation interactions was greater than that accounted for by persons.

The Epstein and O'Brien (1985) review demonstrates, however, that (a) the presumed .30 barrier between self-report and objective measures of a trait can readily be breached, (b) behavior that is situationally specific and temporarily unreliable when based on single observations can often be domonstrated to be highly general and stable when appropriately aggregated, and (c) there are stable, cross-situationally broad response dispositions, or traits.

The major principle involved in the person-situation debate, at least from a measurement standpoint, is that behavior is often highly situationally specific at the individual-item level but general at the aggregate level. This principle is especially relevant to a troublesome issue in rehabilitation research concerning dimensions of client change.

Dimensions of Client Change

For a sample of spinal cord-injured rehabilitation clients, Cook (1983) failed to find a statistical relationship between their self-report scores on the Mini-Mult (Kincannon, 1968) and vocational adjustment as defined by closure status and income. The lack of correlation between the trait measures and several single behavioral items was interpreted as supporting the theoretical position of no relationship between personal adjustment and led to questioning the efficacy of using work therapy to enhance psychological well-being. These results of their interpretation were consistent with previous studies by Bolton (1974, 1978) and Growick (1979).

It should be noted, however, that the second study by Bolton (1978) did not use a single behavioral item to define vocational adjustment and his conclusion was less unequivocal. In the later study the residual change scores from the seven factors of the Human Service Scale (HSS) (Kravetz, 1973) and the five factors of the Client Outcome Measure (COM) (Westerhide & Lenhart, 1973), administered at intake and at closure, were factor analyzed. Since both instruments were constructed using a factor analytic methodology, it should be no surprise that change scores derived from the 12 scales would form factors based on whatever content themes existed in the data.

In considering what this factor analysis implied about the independence of vocational and personal adjustment, it should be remembered that an N of 31 does not provide an adequate data base to compute a reliable factor analysis. Also, the first factor to emerge, and the one considered most independent of the remaining factors, consisted of the HSS economic self-esteem and vocational self-actuation scales and the COM economic/vocational status scale all of which were defined by items of economic information available in the client's service record such as source of support, weekly salary, and work status. Thus the method of measurement was essentially different from the other factors and therefore introduced an additional source of variation. The second factor obtained was a more trait-like factor which could be called personal adjustment because the three HSS sub-scores and one COM scale loading on this factor contained mostly psychopathology items. The defining characteristic of the third factor was social adjustment. It consisted of the HSS family and social needs scales and the COM Family Relationships factor. The HSS social score, being primarily an activities measure, had a negative loading (-.15) on the fourth obtained factor which was of equal strength to its positive loading on the social factor. This factor also included the physical functioning scale and the work tolerance scale from the COM. The fourth and final factor might best be interpreted as activities of daily living. The investigator reported that the highest interfactor correlation (.26) occurred between factors I and II. In other words, economic/vocational status was correlated more with personal maladjustment than with social adjustment or activities of daily living and personal maladjustment was more highly correlated with economic/vocational status than with social adjustment or activities of daily living. Thus, a moderate relationship between an indicator of personal adjustment and indicator of vocational adjustment was found even when the methods of measurement was quite different. The fact that residual change scores from the HSS Emotional Needs sub-scores (which has the greatest similarity to factor II referred to above as personal maladjustment) showed a strong correlation with all five of the Client Outcome Measure residual change scores (.40-.48) provides additional evidence for the lack of independence between changes in personal adjustment and changes in vocational adjustment during rehabilitation.

On the one hand, Bolton presented the 1978

paper as a replication of the 1974 study in which he concluded that "vocational success and psychological adjustment are independent dimensions of client change during the rehabilitation process" (p. 103) and on the other hand he concluded the 1978 study with the statement that: "The broadest conclusion that is supportable at the present time is that psychosocial adjustment and vocational adjustment are distinguishable yet related dimensions of client improvement during the rehabilitation-counseling process." (p. 13) Growick (1979) and Cook (1983) cited both studies as supporting a lack of relationship between changes in personal adjustment and vocational adjustment during the rehabilitation process. When all of the available studies are considered, it appears to this reviewer that the independence observed between the two dimensions was an artifact of the measurement methodology used and the kinds of statistical manipulations employed.

A Holistic Model of Self-in-Situation Adjustment

Since successful rehabilitation as practiced in democratic cultures depends heavily upon the voluntary cooperation of the individual receiving services, we must be able to translate the process and products of vocational evaluation into the process of client self-assessment. "Self-assessment is the process of summarizing one's satisfactions and dissatisfactions with self and with the personally relevant aspects of one's situation," (Akridge, 1981, p. 37). Most of this paper has focused on the field's inability to deal iwth the self-situation distinction in an adequate and non-dualistic manner. Of equal importance, however, has been the field's lack of attention to sources of self-satisfaction and its over-emphasise on psychopathology.

A review of the self-assessment literature reveals a proliferation of instruments relating to various aspects of self-dissatisfaction (e.g., MMPI type measures, anxiety scales, most self-concept measures, and other indicators of psychopathology such as Factors II and II of the Human Service Scale). There is however, a paucity of instruments which tap personal effectiveness skills and other personal attributes that constitute the source of self-satisfaction or positive affect.

While the measurement of negative affect has been a major part of the psychological adjustment literature, the field is just now becoming aware that positive affect is not just the absence of negative affect. A meta-analysis by Watson and Tillegan (1985) demonstrated that a basic two-dimensional structure of positive affect and negative affective and their respective sub-factors represent the major dimensions of emotional experience. As such, positive affect and negative affect have different correlates across an array of personality dimensions.

After discovering that even the relatively more comprehensive personal adjustment measures such as the Human Services Scale (which was supposedly based on Maslow's positive model of human nature) did not include a measure of adjustment skills, I began developing such a measure. Sample items from this measure, which was initially referred to as the Psychosocial Development Matrix (Akridge, 1981), are included in Table 1, along with selected items from the Human Service Scale to represent the four dimensions of self-in-situation assessment. Previous attempts to describe the dimensions of personal adjustment, work adjustment, or the larger system of which these two elements are components, are incomplete and distorted when the factor of adjustment skills is left out.

Summary

Historically, the development of the social and behavior sciences lagged behind the development of the physical and biological sciences and therefore copied their models. Scientific activity, like every other known human activity is shaped by the perceptions, conceptions, feelings, intentions, and actions of the persons involved. The world view, or frame of reference of the investigator determines the questions asked and the methods used to answer them.

The development of quantum theory led to a radical paradigm shift in the physical and biological sciences. Unfortunately, the social and behavioral sciences are still basing their models on a science that no longer is. The case was made that many of the current difficulties involved in trying to integrate research findings in the field of human services are related to the need for a new paradigm for understanding human experience.

Table 1 PDM and HSS Items Representative of the Major Self-Assessment Dimensions

A. Self-Satisfaction (PDM Factors I, II, & III)
   - 67. My ability to control my own feelings.
   - 56. My ability to relax my body whenever I I wish to.
   - 48. My ability to show caring to the people who are important to me.
   - 88. My ability to ask for what I want instead of always waiting for permission.
   - 113. My ability to objectively specify the degree to which I accomplish previously set goals.
   - 33. My ability to know what I want to see happen in any situation.

B. Self-Dissatisfaction (HSS Factors I & II)
   - 5. How often are you bothered by rapid heartbeat?
   - 52. How often do you worry about your health?
   - 16. How often do you worry about the future?
   - 34. How often have you considered a doctor, psychiatrist, psychologist, or anyone else about a nervous problem?

C. Situation Satisfaction (HSS Factor V & VII)
   - 15. How often do you get together with friends (going out together or visiting each other's home)?
   - 54. Number of activities taken part in with other people in your community?
   - 64. How often does your present work let you make decisions on your own?
   - 76. How often are you told in your present work that you have done a good job?

D. Situation Dissatisfaction (HSS Factors III, IV, & VI)
   - 48. How often do you worry about having enough money?
   - 56. How many weeks during the last six months

were you unemployed?
17. How often has your family failed to help you when you needed help?
27. How often does your family accept you as you are?

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CALIBRATION OF A HAND GRIPPER

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ABSTRACT

The following paper presents a unique method of testing grip strength by using a calibrated hand gripper. Part one of the paper describes the method for calibration of two types of hand grippers. Part two compares the readings obtained from the hand gripper to readings from a dynamometer in 45 hands. Part three compares gripper readings to dynamometer readings in a hand patient population and explores potential clinical application.

CALIBRATION OF A HAND GRIPPER

Hypothesis

In the past, some hand patients have been observed to have poor or inconsistent dynamometer readings, but seem quite able to use their injured hand in more dynamic activities such as squeezing putty or using a gripper hand-exerciser. It became useful then, to report patient's progress by documenting their performance with these devices. Particularly useful was the hand gripper because progressive amounts of resistance could be added to it in the form of rubber bands or steel springs.

Documenting patient performance on a hand gripper could be made much more useful if clinicians knew precisely how many pounds of force were required to move a gripper through its range of motion. By using a calibrated gripper, the patient could be tested without necessarily knowing that he was being tested.

The hypothesis presented by this paper is that there is a correlation between static dynamometer readings and dynamic gripper readings, and that a clinician can predict with a high degree of accuracy the grip strength of the patient from the calibrated gripper alone.

Method

The experiment was divided into three parts:

I. Calibration of two types of hand grippers;

II. Test and comparison of dynamometer and gripper readings on normal subjects;

III. Test and comparison of dynamometer and gripper readings on hand patients.

I. CALIBRATION OF THE HAND EXERCISERS

Two types of hand-exercisers were used. The first was a rubber band gripper, purchaseable at any of a number of suppliers. the gripper was suspended in a vice with one size 64 rubber band attached in the center. (See fig. 1.)

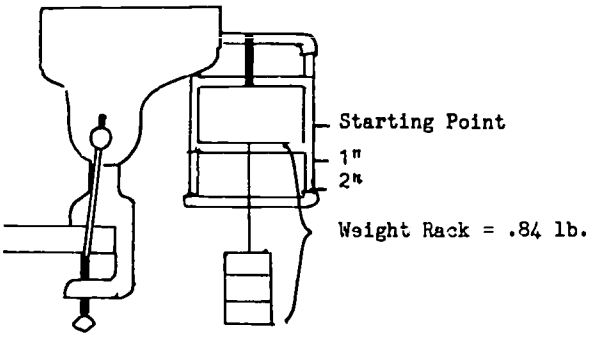


fig. 1 Rubber band gripper

A weight rack weighing .84 lbs. was hung on the movable bar of the gripper, the part normally pulled upon by the human hand. Weights were then attached until:

1. the bar moved 1"
2. the bar moved 2" or the full range of motion of the gripper.

The amount of weight was recorded at the 1" mark and again at the 2" mark. This process was repeated three times. Five size 64 rubber bands were added one at a time in a symmetrical fashion. Each time, three more measurements were taken at the 1" mark and again at the 2" mark. With the addition of four rubber bands, it was necessary to use two loaded weight racks to move the bands through 2". The weights recorded below equals the total weight of the weight rack(s) plus the weights.

1. weight rack = .84 lbs.
2. weight racks = 1.68 lbs.

Calibration of the rubber band exerciser recorded in pounds of force required to pull 1-5 rubber bands a distance of 1" or 2":

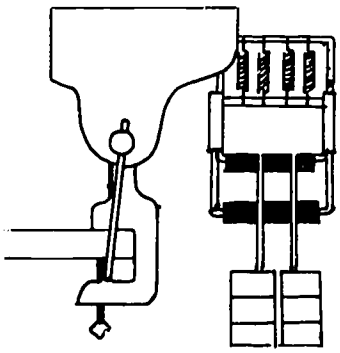
Number of bands:

Trial	1		2		3		4		5	
	1"	2"	1"	2"	1"	2"	1"	2"	1"	2"
1	8.84*	11.84	12.84	21.84	15.84	25.84	24.84	38.68	29.68	47.68
2	5.84	10.84	16.84	23.84	19.84	29.84	21.84	37.68	33.68	45.68
3	4.84	9.84	15.84	20.84	16.84	27.84	24.84	42.68	28.68	44.68
Avg	6.17	10.51	15.71	22.17	17.17	28.17	23.84	39.68	29.68	45.01

* pounds

The second type of gripper tested was a steel spring gripper purchaseable from G. E. Miller. The experiment was repeated following the same format:

1. three trials for one spring
2. one spring added at a time with three trials for each additional spring



2 Weight Racks = 1.68 lb.

fig. 2 Steel spring gripper

Again, two weight racks were added as the resistance increased. See fig. 2. Following are recordings at 1" and 2" from the starting point for three trials for each spring.

No. springs:

Trial	1		2		3		4	
	1"	2"	1"	2"	1"	2"	1"	2"
1	12.84	17.84	26.84	36.84	39.84	54.68	49.68	72.68
2	12.84	17.84	26.84	36.84	39.84	54.68	49.68	72.68
3	12.84	17.84	26.84	36.84	39.84	54.68	49.68	72.68

One conclusion drawn at this point was that steel springs are more reliable than rubber bands. This is probably due to the manufacturing variance of rubber bands.

II. TEST AND COMPARISON OF DYNAMOMETER AND GRIPPER READINGS ON NORMAL SUBJECTS

The second part of this experiment tested dynamometer and gripper readings on normal subjects. The tests were followed by a comparison of dynamometer and gripper readings to see how well the gripper could predict dynamometer readings.

23 persons were selected at random ranging in age from 23 to 57. There were 15 females and 8 males. A total of 45 hands were tested to obtain the following data:

1. 5 dynamometer readings at the setting is approximately 2" wide and more closely resembles the starting point of the two grippers than any of the other four settings. The following readings were obtained from the dynamometer:
   a. the average or mean score
   b. the range in which the readings fell.
2. The maximum reading from the rubber band exerciser.
3. The maximum reading from the steel spring gripper.

If the subject was able to pull the gripper past the midpoint of 1" but not to the 2" mark, the reading was taken in terms of a range inch-pounds of force required to pull between one and two inches. For example, it requires 12.84 lbs. to pull one spring one inch, and 17.84 lbs. to pull one spring 2 inches. If a person pulled one spring 1.5 inches, we can ascertain that the force required to pull it that distance, was somewhere between 12.84 - 17.84 lbs.

If the subject was able to pull one spring exactly to the 1 inch mark, then the reading recorded was 12.84 lbs. The halfway mark was marked with a magic marker.

If the subject was able to pull one spring 2 full inches, the reading would not be recorded until the subject had tried the gripper with two springs. This way, only the maximum readings were recorded. The subject was considered to have pulled the movable bar the full two inches if either:

a. the movable bar touched the base,
b. the fingers touched the palm and no more motion was possible.

When the rubber band gripper was calibrated, averages of the three trials were calculated. Readings from the rubber band gripper were taken according to these averages. For example, if a subject pulled a rubber band gripper with four bands 1", the reading recorded was the average or 23.84 lbs. If a subject pulled four bands between 1-2", the reading was recorded as a range of the averages (23.84 - 39.68 lbs.).

In the above examples, all readings would have both a lower and upper limit; however, when testing subjects on a gripper with five bands or four steel springs, no upper limit could be set because the grippers were not calibrated beyond this point. In other words, if a subject was able to pull the rubber band gripper with five bands the full two inches, the reading was recorded as greater than (>) 46.01 lbs. If a subject was able to pull the steel spring gripper with four springs the full two inches, the reading was recorded as > 72.68 lbs. Both types of grippers had a maximum range of motion of 2".

Due to space constraints, the actual dynamometer and gripper readings for each of the 45 hands tested could not be included in this paper; however, an addendum is available on request.

To establish the accuracy of the grip strengths predicted from the gripper readings, comparisons were made:

1. between each subject's dynamometer and rubber band gripper readings,
2. between each subject's dynamometer and steel spring gripper readings.

It was found that in testing normal subjects, one person's dynamometer readings could deviate as much as 7 to 8 lbs. from the mean score. There could be as much as 15 lbs. difference between the lowest and highest score. For this reason, dynamometer readings were compared with gripper readings in terms of their range rather than in terms of a single number.

Figure 3 identifies the total number of grip strengths which were accurately predicted by the rubber band gripper as 39 out of 45(Total of column 1 and 2). This is equal to about 86.6% accuracy. The chart also identifies the number of grip strengths predicted by the gripper that lie within 5, 10, 15, and 20 lbs. of the dynamometer reading as 4 out of 45 or 8.9%.

In this first comparison between dynamometer and rubber band gripper measurements, the gripper predicted that 26 people had grip strengths over 46.01 lbs. This was, in fact, accurate, but the reader should note that in 20 of these cases, the gripper calibration did not predict the upper limit of the range because it had not been calibrated beyond 5 rubber bands. These cases have been indicated in Fig. 3 with an asterisk and placed in columns according to how far beyond 46.01 lbs. the readings fell when compared to the dynamometer.

Figure 4 identifies the total number of grip strengths which were accurately predicted by the steel spring gripper. (Total of column 1 and 2) In this comparison between steel spring gripper readings and dynamometer readings, 35 out of 45 or 77.7% of the cases were accurately predicted by the gripper. Four of these cases were accurately predicted to be above 72.68 lbs. but had no upper limit because the gripper had not been calibrated beyond 4 steel springs.

These cases are identified by asterisks in fig. 4 and placed in columns according to how far beyond 72.68 lbs. they fell when compared to the dynamometer. 10 out of 45 or 22% of the readings were found to be within 5 or 10 lbs. of the dynamometer readings.

III. TEST AND COMPARISON OF DYNAMOMETER READINGS TO BOTH RUBBER BAND AND STEEL SPRING GRIPPER READINGS IN A HAND PATIENT POPULATION

The injured hands of eight subjects were tested in a manner identical to that of the normal subjects.

1. 5 dynamometer readings
   a. mean
   b. range
2. maximum reading from the rubber band gripper
3. maximum reading from the steel spring gripper.

The results of this data are in the addendum which is available on request. Fig. 5 indicates 9 out of 16 or 56.25% of the gripper readings were either accurate of overlapped with the dynamometer readings. 6 out of 16 or 37.5% of the gripper readings fell within 5,10, or 15 lbs. of the dynamometer readings. 1 out of 16 or 6.2% fell in the "over 20 lb. difference" category.

There appears to be a significant difference between the outcome of the gripper-dynamometer comparison on normals versus hand-patients. Some problems which may account for the difference include the following:

a. Size of sample (needs to be larger).
b. Not all the patients had full range of motion. Limited range of motion would prevent a patient from pulling the full two inches regardless of how many rubber bands or springs were attached.
c. The fatigue factor may have been greater in the hand patients. All participants were asked to perform the testing sequence without a break.

It is clear that another study must be completed, taking into consideration the above factors in order for accurate conclusions to be drawn regarding the hand patient population.

Clinical Application and Conclusion

In conclusion, it appears that the rubber band grippers can be calibrated reliably and can be used to predict dynamometer readings with 86.6% accuracy in a normal population. The steel spring gripper can also be calibrated reliably and in this study, predicted dynamometer readings with 77.7% accuracy.

There also appears to be great potential for using this method with hand patients to detect withholding of maximum effort. If, for example, a patient consistently pulls four springs between 1 and 2 inches and has dynamometer readings which are in the 10-20 lb. ranges, one could question whether the patient was exerting maximal voluntary effort on the dynamometer, a device known to the patient as a testing device. The patient is probably more likely to behave more naturally when tested without his knowledge that he is being tested.

Conversely, by using calibrations, a therapist is able to set the gripper at the proper amount of resistance for beginning a graded resistive exercise program to increase grip strength. The patient can then participate in an exercise which is mild enough to be safe for him, yet resistive enough to be therapeutically beneficial.

Fig. 3 ACCURACY OF PREDICTION OF GUIDE [illegible] BAND CUTTER
(WHEN COMPARED WITH DYNAMOMETER READINGS)

NORMAL SUBJECTS

No. of bands/distance	No. of accurate predictions	Overlap	Within 5 lbs.	Within 10 lbs.	Within 15 lbs.	Within 20 lbs.	Over 20
4 bands/2"	20	5	2 4*	2*	2*	0*	0*
4 bands/1 - 2"	5	10	2		1		
4 bands/1"	1				1		
3 bands/2"							
3 bands/1 - 2"							
3 bands/1"							
2 bands/2"							
2 bands/1 - 2"							
2 bands/1"							
1 band/2"							
1 band/1 - 2"							
1 band/1"							
TOTALS	26	15	4		2		

Sample consists of 45 bands, 39 out of 45 readings fell into the accurate or some overlap categories. This is equal to 86.6%

* These numbers reflect those cases accurately predicted to be over 46.01 lbs. The upper limit could not be predicted because the gripper was not calibrated past 5

Fig. 4 ACCURACY OF PREDICTION [illegible]
(WHEN COMPARED WITH [illegible])

NORMAL SUBJECTS

No. of springs/distance	No. of accurate predictions	Overlap	Within 5 lbs.	Within 10 lbs.	Within 15 lbs.	Within 20 lbs.	Over 20
4 springs/2"	6	1	1 2*	1*	1*	1*	1*
4 springs/1 - 2"	5	6		1			
4 springs/1"	1		1				
3 springs/2"	1						
3 springs/1 - 2"	5	5	1				
3 springs/1"	3		3	1			
2 springs/2"	1						
2 springs/1 - 2"		2					
2 springs/1"							
1 spring/2"							
1 spring/1 - 2"							
1 spring/1"							
TOTALS	22	13	6	4			

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Sample consists of 45 bands. [illegible] of 45 readings fell into the accurate or overlap categories. This is equal to [illegible]

*Reflect incidences of cases accurately predicted to be over 72.68 lbs. The upper limit could not be predicted because the gripper was not calibrated beyond 5 springs

fig. 5 ACCU[illegible] PREDICTION OF [illegible] (WHEN COMB[illegible])

HAND PATIENT POPULATION

*+ tested on rubber band gripper
** tested on steel spring gripper

No. of bands of springs/distance	No. of accurate predictions	Overlap	Within 5 lbs	Within 10 lbs	Within 15 lbs	Within [illegible]	[illegible]
5/2"	+fx 5th met +fracture	+crush				(*fracture	
5/1 - 2"				+extensor tendon repair			
5/1"	+amputation		+Dupuytren's				
4/2"							
4/1 - 2"	**fracture	**fx 5th met.					
4/1"							
3/2"							
3/1 - 2"			**extensor tendon repair				
3/1"				**amputation	+thumb crush		
2/2"							
2/1 - 2"	+wrist fx	(border line) **Dupuytren's					
2/1"				**crush			
1/2"							
1/1 - 2"		**wrist fx					
1/1"							**[illegible]
TOTALS	5	4	2	3	1		1

Samples consist of 16 injured hands. [illegible] of 16 fall into the accuracy or overlap categories. (Matheson)
*Represents those cases without an upper limit.

REFERENCE LIST

Matheson, Ph.D., Leonard N. (1984). Work Capacity Evaluation. Anaheim, California: E.R.I.C.

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ADDENDUM

The following data was used to formulate the statistics in the scientific paper "Calibration of a Hand Gripper" presented at the National Forum on Vocational Issues; Dallas, Texas, 1986.

SAMPLE: 45 normal hands
8 injured hands

DATA TAKEN:

1. Five dynamometer readings (pounds/force)
2. Average dynamometer reading (pounds/force)
3. Range of Dynamometer readings (pounds/force)
4. Maximum rubber band gripper reading (pounds/force)
5. Maximum steel spring gripper reading (pounds/force)

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NORMAL SUBJECTS

Subject No. 1:

Five Dynamometer Readings: 65,50,58,58,58 (lbs.)

Average Grip Strength: 57.8 (lbs.)

Range of Dynamometer Readings: 50 - 65 (lbs.)

No. of rubber bands/distance/force required: 5/2" > 46.01 (lbs.)

No. of steel springs/distance/force required: 3/2" 54.68 (lbs.)

(Subject No.) 2: 80,66,69,70,75

68

66 - 80

5/2" > 46.01

4/1 - 2" 49.68 - 72.68

3: 44,46,40,36,40

41.2

36 - 46

5/2" > 46.01

3/1 - 2" 39.84 - 49.68

4: 55,60,59,56,50

56

50 - 60

5/2" > 46.01

4/ 1 - 2" 49.68 - 72.68

5: 35,40,37,40,40

38.4

35 - 40

5/1 - 2" 29.68 - 46.01

3/1" 39.84

6: 45,50,50,54,50
49.8
45 - 54
5/2" > 46.01
3/1 - 2" 39.84 - 54.68

7: 86,85,81,74,76
80.4
74 - 86
5/2" > 46.01
4/2" > 72.68

8: 98,110,100,98,92
99.6
92 - 110
5/2" > 46.01
4/2" > 72.68

9: 45,55,50,45,50
49
45 - 55
5/1 - 2" 29.68 - 46.01
3/1" 39.84

10: 50,35,55,40,35
43
35 - 55
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

11: 55,52,50,55,44
51
44 - 55
5/2" > 46.01
3/1" 39.84

12: 48,35,40,42,40
41
35 - 48
5/1 - 2" 29.68 - 46.01
3/1" 39.84

13: 100,85,85,75,78
84.6
75 - 100
5/2" > 46.01
4/2" > 72.68

14: 115,95,95,105,100
102
95 - 115
5/2" > 46.01
4/2" > 72.68

15: 45,38,38,32,30
36.6
30 - 45
5/2" >46.01
3/1 - 2" 39.84 - 54.68

16: 45,45,52,47,45
46.8
45 - 52
5/2" > 46.01
4/1" 49.68

17: 80,80,93,95,95
88
80 - 95
5/2" > 46.01
4/2" > 72.68

18: 86,100,95,110,98
97.8
86 - 110
5/2" > 46.01
4/2" > 72.68

19: 54,47,45,50,48,20
48.8
45 - 54
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

20: 57,55,45,49,48
50.8
45 - 57
5/1 - 2" 29.68 - 46.01
3/1" 39.84

21: 35,41,39,44,41
40
35 - 44
5/1 - 2" 29.68 - 46.01
2/1 - 2" 26.84 - 36.84

22: 47,46,47,45,48
46.6
45 - 48
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

23: 36,40,40,46,41
40.6
36 - 46
5/1 - 2" 29.68 - 46.01
2/1 - 2" 26.84 - 36.84

24: 47,50,54,48,46
49
46 - 54
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

25: 46,51,50,46,41
46.8
41 - 50
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

26: 60,63,59,59,53
58.8
53 - 63
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

27: 66,71,73,68,66
68.8
66 - 73
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

28: 86,79,84,83,80
82.4
79 - 86
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

29: 70,58,50,55,55
57
50 - 70
5/1 > 46.01
4/1 - 2" 49.68 - 72.68

30: 85,79,65,60,50
66.5
50 - 85
5/2" > 460.1
4/1 - 2" 49.68 - 72.68

31: 45,40,40,40,40
41
40 - 45
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

32: 55,45,40,45,40
45
40 - 45
5/1 - 2" 29.68 - 46.01
3/1" 39.84

33: 70,60,70,55,58
62.6
55 - 70
5/2" > 46.01
4/2" > 72.68

34: 65,70,78,77,77
73.4
65 - 78
5/2" > 46.01
4/2" > 72.68

35: 55,55,54,50,48
52.4
48 - 55
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

36: 65,60,60,60,58
[illegible]
60 - 65
5/1 - 2" 29.68 - 46.01
3/1 - 2" 39.84 - 54.68

37: 46,45,38,35,45
41.8
35 - 46
5/1 - 2" 29.68 - 46.01
2/2" 36.84

38: 54,50,48,45,45
48.4
45 - 54
5/1 - 2" 29.68 - 46.01
3/1" 39.84

39: 70,65,55,60,50
60
50 - 70
5/1 - 2" 29.68 - 46.01
4/1" 49.68

40: 80,65,58,74,72
69.8
58 - 80
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

41: 45,28,45,35,48
40.2
28 - 48
5/1" 29.68
3/1" 39.84

42: 50,45,55,40,45
47
40 - 55
5/1" 29.68
3/1" 39.84

43: 68,65,70,68,70
68.2
65 - 70
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

44: 68,70,65,68,65
66
65 - 70
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

45: 60,70,72,77,70
69.8
60 - 77
5/2" > 46.01
4/1 - 2" 49.68 - 72.68

1' Dupuytren's Contracture: 10,16,18,24,26

Average Grip Strength: 18.8 (lbs.)

Range of Dynamometer Readings: 10 - 29 (lbs.)

No. of rubber bands/distance/force required: 5/1" 29.68

No. of steel springsdistance/force required: 2/1 - 2" 26.84 - 36.84

2' Amputations digits 3,4 to PIP: 30,30,28,33,30,34

30.8

28 - 34

5/1" 29.68

3/1" 29.84

3' Comminuted finger fx (index): 65,55,65,70,64

65.8

64 - 70

5/2" 2 46.01

4/1 - 2" 49.68 - 72.68

4' Crush injury: 60,55,35,45,35

50

35 - 60

5/2" 2 46.01

2/1" 26.84

5' Stiff right index secondary to extensor tendon repair: 55,64,65,69,68

64

55 - 69

5/1 - 2" 29.68 - 46.01

3/1 - 2" 39.84 - 54.68

5. Left thumb crush injury:	40,31,37,35,35
	31 - 40
	3/1" 17.17
	1/ < 1" < 12.84
7. Left comminuted wrist fracture:	21,24,20,16,16
	19.4
	16 - 21
	2/1 - 2" 15.17 - 22.17
	1/1 - 2" 12.84 - 17.84
8. Fracture 5th metacarpal:	84,68,7 87,94
	84.3
	70 - 94
	5/2" > 46.01
	4/1 - 2" 49.68 - 72.68

WORK/ABILITIES: AN INTEGRATIVE APPROACH TO VOCATIONAL EVALUATION

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Abstract

Work/Abilities evaluation is a holistic approach to vocational evaluation which assesses the physical, intellectual, emotional and neuropsychological functioning of adults with severe physical or neurological disabilities. Strong emphasis is placed on the relationship of the individual's physical ability to neurological and cognitive abilities. The evaluation outcome is an integrated profile of the individual's capacity for productive employment, with specific recommendations made for placement possibilities, training options, engineering modifications or assistive devices.

Since 1972, the employment of individuals with severe physical disabilities has been a major focus of Cerebral Palsy Research Foundation of Kansas, Inc. (CPRFK). To achieve this goal, rehabilitation engineers of CPRFK have worked to design or modify tools, equipment and work place environments for workers with severe disabilities. In response to a need of business and industry for a method of defining appropriate task modifications for persons with specific handicapping conditions, the Rehabilitation Engineering Center at Wichita State University developed the Available Motions Inventory (AMI) to evaluate the aptitudes for performance of workers with physical disabilities. (Malzahn, 1984) The AMI also provided an objective basis for the development of adaptive equipment and machine modification to enhance the individual's productivity.

Over time, it was determined that assessing just the physical functioning of the severely disabled individual was not sufficient. Physical performance is one dimension of the individual's employability. Other factors, such as intelligence, cognition, motivation, personality and neuropsychological functioning all contribute to the individual's ability to become employed and maintain that employment. Understanding only one part of the individual's functioning was to ignore the whole.

The Work/Abilities Evaluation Program was developed by CPRFK in 1984 to provide a holistic evaluation of the severely disabled individual's potential for employment. Thus, the Work/Abilities evaluation assesses the individual's overall physical, cognitive, and neuropsychological functioning and the interaction of these elements. The emphasis of the evaluation is on the relative strengths of the severely disabled individual, rather than the specific deficits.

Physical Abilities Evaluation Component

The physical abilities evaluation component seeks to incorporate information gained through a complete physical therapy assessment, the Available Motions Inventory, and an engineering/assistive device assessment (as necessary).

Physical Therapy Evaluation

A measurement of the individual's range of motion, general motor functioning, and mobility is the outcome of the physical therapy evaluation. This evalua-

tion is typically administered prior to the AMI and possible contraindications as they relate to the individual's efforts on the AMI are provided. Ambulation and/or alternate mobility means and adaptive seating are also areas of assessment, as applicable. Recommendations for possible exercise programs for the individual, as appropriate, and indicated adaptive equipment requirements in the vocational setting are summarized in a report following the evaluation.

Available Motions Inventory

The core of each physical ability evaluation, the AMI provides an assessment of the upper extremity capability of individuals with neuromuscular impairments to perform industrial related jobs involving light bench work, light assembly, machine control and manual operations (Leslie, 1976; Malzahn, 1979). It is a system that falls between pure anthropometric assessments and work samples (Malzahn, 1984) to produce a detailed knowledge of an individual's functional abilities, rather than the individual's disabilities. Such detailed information is essential, quantitatively, for the determination of job placement and/or the design or modification of machine and work environments by rehabilitation engineers.

It is common practice to use broad classifications established by medical diagnoses as qualitative descriptors of the physical impairment. Use of such categories as indicators of physical status are, however, inherently limited in describing functional abilities. Similarly, traditional work sample evaluation methods tend to provide ample information about specific deficits, but very little about relative strength. Insofar as most vocational evaluations provide a measurement of job skills (Botterbusch, 1977), the AMI was designed to measure abilities that are the precursors to such job skill development. What is measured is specific functional motion and control, by whatever means the person is capable of producing (Malzahn, 1984).

The AMI Evaluation System The AMI samples these capabilities through 71 separate evaluation items for each hand, a total of 142 measures. An adjustable test frame resembling a console-type work station is used to mount 12" square subtest panels in various locations to the individual seated in front of the console (see Figure 1).

Six (6) categorical subtests are designed to simulate components of industrial jobs evaluated with respect to strength, accuracy, or rate of performance. The subtests involve various switches (for accuracy and rate of performance), settings (for accuracy and rate of performance), rate (for gross rate of performance using larger muscle groups), strength (pinch, grip, applied torque and applied force), assembly (for fine motor control, accuracy and rate of performance), and reach-reaction (for rate of performance in response to a stimulus).

Subtest	Position* CLH	SLH	CLV	CUV	SUV	Description
Switch Activation						
Push Button	X	X	X	X		27–¾" square detent push buttons–activate 9
Toggle Footswitch	X		X	X	X	27–3 position toggle switches–activate 18 Industrial tredle footswitch–rate of activation
Settings						
Finger Knob	X		X	X	X	10–¾" dia. knobs with pointer–setting at 36" intervals
Detent Knob	X		X	X	X	10–¾" dia. knobs with pointer–detent at 36" intervals
Handknob	X	X	X	X	X	2–½" dia. scalloped handknobs with settings at 2.1° intervals
Slide	X	X	X	X		Horizontal & vertical linear slide switches –settings at ½" increments
Balanced Crank	X	X	X	X		1–½" radius crank, settings at 2.1° intervals
Crank	X		X	X	X	3–½" radius cranks, settings at 2.1° intervals
Reach-Reaction						
Lateral Reach	X					Time required to move hand from a point in front of body 12" to the side
Transverse Reach	X					Time required to move hand from a point in front of body 12" to a more distant point in front
Lateral Move	X					Time required to move hand from a point 12" to the side to directly in front of the body
Transverse Move	X					Time required to move hand from distant point in front of body 12" to a point in front of the body
Reaction Time	X					The time required to respond to an auditory stimulus

*Positions
CLH (Center Lower Horizontal) –Horizontal work surface at seated elbow height with center of area 75% of reach
SLH (Side Lower Horizontal) –Horizontal work surface at seated elbow height with center 20" lateral to the CLH position
CLV (Center Lower Vertical) –Vertical work surface at 90% of reach and 6" above seated elbow height
CUV (Center Upper Vertical) –Vertical work surface at 90% of reach and 18" above seated elbow height
SUV (Side Upper Vertical) –Vertical work surface at 45° to the frontal plane and 20" lateral to the CUV position

Figure 1. A sample of subtests and positions on the Available Motions Inventory.

All tests are administered with the individual seated in a wheelchair, or industrial type seating, and positioned for optimal functional reach to the left and right, and from table height to shoulder height. The test frame can be adjusted vertically, as necessary, so that all horizontal panel surfaces are 1" above the seated individual's elbow height, as measured from the floor.

The administration of the test and data collected follows an established program sequence to ensure a standardized procedure. Each subtest is given for the left hand, then the right, and subtest raw scores are calculated and recorded in units of pounds/inch-pounds for strength items, and correct actuations per unit of time for timed tests.

Raw data scores are translated into "ability scores" and into "motion-class scores".

Ability scores The ability scores provide for intra-individual ability comparisons, e.g., whether an individual s

more capable of using a hand knob for initiating or controlling an activity than by using switches, for example, and which is the best position for any particular activity. The ability scores also furnish inter-individual ability comparisons to determine how capabilities compare with other persons within the same target group.

For comparison, a normalized ability scale was established based on the mean dominant hand performance of the AMI evaluation sequence by 80 able-bodied individuals (43 males, 37 females, 18 to 55 years of age), with the zero point indicating the mean performance of the standard population. The 71 separate ability scores are finally consolidated into 14 motion-class scores.

Motion-class scores. Motion-class scores are based upon motion-order and the quality of motion. A factor analysis of the relevant components of the upper extremity dexterity yielded two factors to be useful for defining motion-order: (1) the body member primarily involved, and (2) the degree of control involved (Malzahn, 1984). Motions can be defined along a continuum from fine (finger) to gross (whole arm) movements and the dominant body member involved in controlling the movement determines four motion-order groups, and are thus classified as: (1-) fingers-knuckles; (2-) hand-wrist; (3-) forearm-elbow; and (4-) arm-shoulder.

Quality of motion is measured in degrees of freedom which defines the complexity of the motion to accomplish a subtest (Rahimi and Malzahn, 1984). Degrees of freedom are described as: (-1) one dimensional (linear) movements, as in moving a lever; (-2) two dimensional (planar, or surface) movements, such as positioning an object on a flat surface by sliding; (-3) three dimensional (spatial) movements, as in reaching out to shake a hand, or to operate a lamp switch; and (-R) rotational movements not correlated with other tasks, such as rolling up a car window, turning a channel selector, using a door knob, etc.

Motion-class scores combine the motion-order (fingers, hand, forearm, whole arm) and the degrees of freedom classification (1, 2, 3, R) systems to comprise 14 motion classes. A motion-class profile (see Figure II) is generated which provides a graphic display of an individual's upper extremity relative ability by body member.

A review of client C's performance, as displayed in Figure II, shows that the right hand (light shaded) is predominantly superior to the left hand (dark shaded) in all motion-classes.

The dominant hand is functioning at marginal performance levels in several motion-classes. This is indicated by scores at or above -3 in motion classes

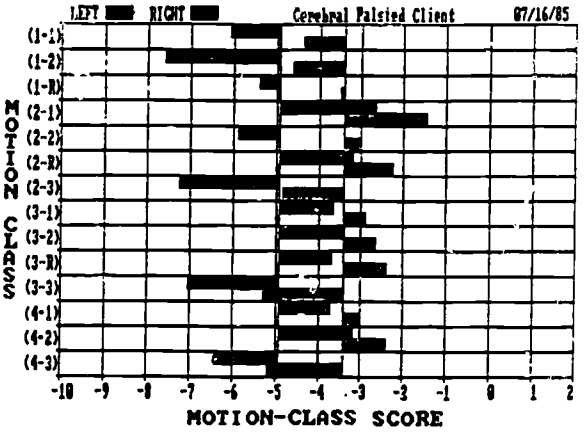

Figure II. AMI Motion-class performance scores for Client C. Body members are: 1 = fingers, 2 = hand, 3 = forearm, 4 = full arm. Motion classes are determined by body member and 1, 2, or 3 degrees of freedom plus rotation (R).

(2-1), (2-2), (2-R), (3-2), (3-R), (4-1), and (4-2). Performance is affected as the complexity of the motion increases for each body member, (2-1) better than (2-3), (3-1) better than (3-3), and (4-1) better than (4-3), with each member superior, overall, to the fingers in all levels of complexity. This is a fairly typical profile for persons with a neurological impairment.

The same kind of analysis can be performed for the subordinant left hand, which, in the illustrated case, is roughly equivalent to the right in ability, but is more severely limited.

Implications of the AMI Motion-Class Profile. Each negative number along the scale to the left of zero (100% of standard) represents one unit of standard deviation. Data in this format allows for a measure of deviation of an individual's performance from able-bodied performance in each motion-class. Scores within -1.0 to +1.0 indicates an average range of abilities. Scores from -1.0 to -2.0 represent adequate performances for most physical activities, but may perform marginally for "competitive" standards. Scores in the -2.0 to -3.0 range are considered substandard performance, and modification of the work station may be desirable for the enhancement of performance. Scores in the -3.0 to -4.0 range represent a serious deficit in abilities; modification of the work site would be required to enable the client to perform at competitive levels. Scores below -4.0 are severely limited levels of performance. More extensive modifications would be required which, situationally, may or may not be performance and/or cost effective. The index of -10 is nonperformance (0% of standard).

Engineering Evaluation

The engineering evaluation presents the principles of rehabilitation engineering which are applicable to the individual's specific needs as determined by the physical therapy evaluation and the AMI to perform more competitively in a vocational setting. These techniques can also be extended to the independent living setting as well.

This evaluation relies heavily on the results of the physical therapy and AMI assessments to evaluate the individual's need for modifications and/or adaptive devices. An interview with the individual supplements information previously gathered and recommendations are made for modifications, as applicable, for possible vocational and/or independent living considerations. A report summarizes items of significance to vocational placement.

Neuropsychological Evaluation Component

The purpose of a neuropsychological evaluation is to look at the whole individual and assess the integrity of all brain systems: motor, tactile-kinesthetic, rhythm, receptive, associative and expressive speech functions, short term and long term memory capability, written language, numerical capacity, visual perception, and the integration of these systems.

Work behaviors of severely disabled individuals are determined by addressing one basic question: Is the brain intact enough to recognize, analyze, organize and direct thoughts or movements, and evaluate the outcome? This question is based on the premise that all purposeful behavior is brain induced and directed. The effect of lesions on any part of the brain may have far reaching consequences on the behavior of the individual. This is emphasized by Luria (1973) by describing a lesion of the right hemisphere of the brain, for example, which may result in the remarkable absence of perception by the individual of existing physical or personality deficits.

Because the functioning of the brain systems and their integration affects the cognitive and intellectual capability of the individual to function in competitive employment, the evaluation begins with a neuropsychological screening. The Reitan-Indiana Aphasia Screening Test and the Reitan-Klove Sensory Perceptual Examination are used because of their sensitivity to basic disorders of language function or sensory-perceptual deficits. This screening provides a quick preview of language and non-language functions, left and right brain comparisons, and both intra-individual and inter-individual differences. Deviation from the norm indicates further exploration which may include a comprehensive neuropsychological assessment, usually based on Luria's (1973) investigative techniques.

If an individual has had a traumatic closed head injury, a stroke, a tumor or a developmental disorder, the brain may have compensated for the resulting deficit in a functional capability through another sensory modality. Thus, the visual-motor modality, for example, may become the major communication content area if language is lost.

Personal-Career Evaluation Component

To facilitate the investigation of the brain's systems, the Work/Abilities evaluation includes an assessment of the individual's cognitive abilities through the Structure of Intellect (SOI) test. Based on Guilford's (1967) research that 120 different patterns of intellectual abilities are required for different educational and vocational outcomes, Meeker and Meeker established the Structure of Intellect Institute in 1980. Twenty-four specific cognitive abilities were extrapolated from Guilford's model which are especially predictive of success in education and a broad range of vocations and careers (Meeker, 1969).

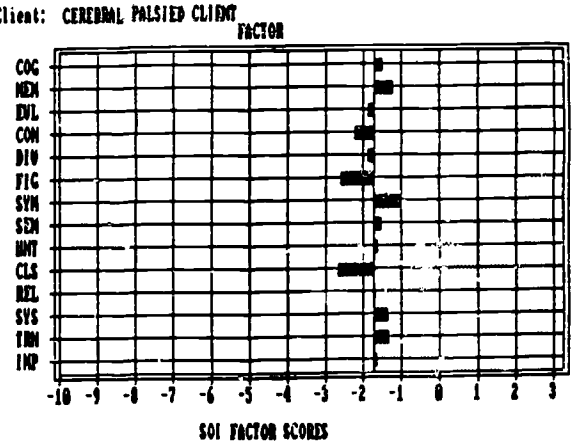

Figure III. SOI profile for Client C. to compare strengths and weaknesses in the Operation, Content and Product components of intelligence.

The SOI is a three dimensional model which assesses the functions of Operation, Content and Product components of intelligence. There are five areas of Operation, which are thought processes required to work with different types of information. They are: cognition (COG), memory (MEM), evaluation (EVAL), problem solving (CON), and creative problem solving (DIV). The Content component defines the kinds of information that persons work with, and are identified as: figural (FIG), symbolic (SYM), and semantic (SEM) functions. The Product component includes units (UNT), classes (CLS), relations (REL), systems (SYS), transformations (TRN), and implications (IMP), which are how persons work

with varying complexities of information. An example would be whether an individual can work with one detail at a time, or can understand how that single detail can be combined with other details to be transformed into a product.

Individual patterns of cognitive functioning may be compared with established patterns of vocational and career areas, thus creating a cognitive map of the individual's strengths and weaknesses (see Figure III). This may be compared to the physical functions of the individual as determined by the AMI.

The use of the SOI is especially helpful in evaluating the potential of severely disabled individuals because it looks at a wide range of vocational aptitudes. Thus, the cognitive ability of the individual to receive and process information, such as understanding routines or directions, may provide clues to appropriate types of work structure and tasks. Memory patterns identify the type of learner and the methods which must be used to maximize the understanding of instructions. Evaluative tests predict the ability to make decisions, to plan or have foresight. Scores in problem solving indicate how well an individual can use information to solve a problem or resolve a situation with a desired outcome.

Personality Characteristics This assessment reviews the personal characteristics and clinical factors which provide personal-career considerations. The Karson Clinical Interpretation of the 16 Personality Questionnaire (16PF) capsulizes patterns for problem solving, coping with stressful conditions, interpersonal interaction, and career, occupational and avocational interests. This test also provides pathological factors which might affect performance and occupational profiles of best fit patterns. Like the SOI, this, too, is a computer generated report that can become quickly accessible and meaningful in matching personality, specific abilities and the motor functions against the neuropsychological background of the individual.

Motivational Analysis Test From the initial interview with the individual and the structured Preliminary Diagnostic Questionnaire, through observations made during the evaluation, to use of the formal Motivational Analysis Test (MAT), a studied assessment is made of the factors which may or may not prompt the individual to work in a competitive market. Economic factors, family situations, pending legal suits, malingering or a vocalized desire to work despite serious physical disabilities are compared against the MAT. The MAT is an objective device with more than 15 years of basic research examining the validity of over 70 different possible motivational strength indicators (Cattell, Horn, Sweney and Radcliffe, 1964). The MAT concentrates on 10 psychologically meaningful unitary motivational systems covering the individual's interests, drives, and the strengths of sentiment and value systems. These are grouped into three major areas of Career motives, Personal and Social motives, and Family and Culture motives. Tested against observations, the interview data, the clinical and personality characteristics analysis, mental abilities, and the standards of motor functions, the weight of evidence is highly predictive of motivation for or against competitive employment.

Summary

This paper has described an approach to the development of vocational evaluation information based on objective data concerning all aspects of a severely disabled individual's employability - physical, emotional, intellectual, motivational, and neuropsychological, in addition to interests and aptitudes. It is believed that the system can make a significant difference in the quantity and quality of placements, because it seeks to conserve the integrity of the individual's ability, evaluating each aspect of functioning and its interactions with each other functioning components - cognitive, physical and neurological. In this way, the maximum potential and possibilities of individuals with severe disabilities may be highlighted and specific recommendations can be made accordingly.

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Critical attributes of vocational rehabilitation facilities: Effects of facility size

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ABSTRACT

This study investigates the characteristics of rehabilitation facilities and examines these characteristics relative to identified national trends in vocational assessment. Data was collected in three broad areas. They are: (1) Client characteristics. (2) Referral sources. (3) Facility characteristics. Analysis of the data in each area was conducted with facility size as a variable. The conclusions drawn from the results of this study should help facility personnel refine existing programs and plan for the development of new programs. Additionally, this study should be helpful to state/federal personnel charged with developing and implementing individual rehabilitation plans.

Vocational rehabilitation facilities today are a major source of vocational assessment for state vocational rehabilitation agencies under purchase of service agreements. Current trends, as identified by rehabilitation professionals in a variety of settings, clearly show that facilities can be a focus of vocational assessment activities even in radically changing political climates. Some of the trends and issues noted at the First National Forum on Issues in Vocational Assessment (1984) included a need to: (1) improve the marketing of assessment services; (2) enhance professionalism; (3) build service networks by specializing vocational services; (4) stress the identification of transferable skills; and (5) incorporate knowledge of biomedical and technological advances into the assessment of vocational potentials.

The identification of trends in staffing, clientele, and services within vocational rehabilitation facilities can help improve our understanding of the factors that will influence the provision of vocational assessments in this latter half of the decade and beyond. This understanding will be helpful to planners within state agencies, rehabilitation facilities, and educational institutions.

An examination of facility characteristics should help at a number of levels. First, it will help assessment personnel working in rehabilitation facilities adapt their services to incorporate these noted trends. Secondly, it will be useful for facility directors and supervisors, as they improve their facilities to meet changing needs and trends, and as they strive to smoothly incorporate and integrate services or programs for optimum effectiveness and efficiency. And thirdly, this knowledge will be of benefit to state and federal agencies faced by seemingly ever tightening budgets.

This project was conducted to provide comprehensive and current knowledge about the structures of vocational rehabilitation facilities. Data represents the fiscal year 1981 to 1982. Utilizing a comprehensive survey sent to all vocationally oriented facilities accredited by CARF, data was collected on 221 facilities (approximately a 40% return rate).

The data collected addressed three broad content areas. The first was Client Characteristics, which included: (1) primary disabilities of the clients; (2) demographic characteristics of the clients; (3) client education; and (4) information about various types of skill training programs completed by the clients. The second content area addressed Client Referral Sources, such as State Vocational Rehabilitation Agencies, Developmental Disability Boards, and Special Education. The third content area addressed Facility Characteristics, including: (1) the number of clients served within the fiscal year; (2) fiscal resources of the facilities; (3) patterns of facility staffing; and (4) programs

and services offered by the facilities.

For analysis purposes, and to clarify the trends found in this study, all responding facilities were classified into one of four size categories, based upon the average number of clients served per day within the fiscal year under investigation. These categories were:

Small Facilities.....1-30 clients served per day
Small-Medium Facilities.....31-70 clients served per day
Medium-Large Facilities.....71-100 clients served per day
Large Facilities.....101+ clients served per day

Client Characteristics

Primary Disabilities

Results for client disabilities showed that by far the large majority of clients within the facilities were mentally retarded (51%), followed by clients who were mentally ill (15%), and then emotionally disturbed (7%). The combined categories of orthopedic, stroke, multiple sclerosis, and muscular dystrophy only accounted for 6% of the clients. When disabilities were combined into functional categories, it was evident (Table 1) that over half the clients (55%) had a disability related to intellectual functioning. Twenty-one percent of the clients had a disability related to emotional or mental functioning, and 16% had a physical capacities disability.

Table 1

Clients' Primary Disabilities (%)
After Grouping Disabilities

Category	FACILITY SIZE Small	S-Med	Me-La	Large	Aver	p
A. Emotional, Mental Functioning	25.64	19.88	20.22	18.94	20.64	
B. Intellectual Functioning	35.16	58.33	52.29	62.35	54.66	<.001
C. Physical Capacities	22.90	14.17	19.37	12.88	16.38	.01
D. Communication Capacities	8.10	4.83	4.67	2.94	4.76	<.05
E. Social Deviance	8.19	2.79	3.46	1.98	3.56	<.005

When accounting for facility size effects on client disability categories, small facilities differed the most from the rest of the sample. Percentage wise, they served a larger variety of disabilities. Small facilities evidenced a significantly lower percentage of clients with the most predominant disabilities (intellectual functioning), and a relatively higher percentage of clients with the less frequently appearing disabilities (including disabilities of physical capacities, communication disorders, and social deviance).

Selected Demographic Characteristics

Several variables were utilized to describe client demographics. These included client sex, race, age, education, and skill training.

Data for sex of clients showed that slightly more than half the clients (55%) were males.

Race data showed that over three-fourths (77%) of the clients were white, and 15% were black. No significant effects of facility size were found for either of these variables.

Client age data showed that, across facilities, the largest percentage of clients (44%) were in their early career ages (25 to 40), and 28% were in their late teens to mid twenties. Thus, 72% of the clients were between 19 and 40. Facility size analyses showed that small facilities again differed from the rest of the sample, in that they served a relatively higher percentage of young clients (18 years of age or less) and a relatively lower percentage of early career age clients.

Data for education showed that over half the clients (58%) had less than a high school education, and an additional 18% had a special education diploma as their highest level of education. Nineteen percent of the clients had a high school diploma as their highest level of education. These results showed that about 95% of all of the clients had a high school diploma or less. This can be seen in Table 2.

Table 2

Client Education
(in percents)

ITEMS	FACILITY SIZE SMALL	SM-MD	MD-LA	LARGE	AVER.	SIGN.
EDUCATION LEVEL OF CLIENTS ENTERING FACILITY						
< High School Diploma	48.26	60.25	63.92	56.86	57.89	
High School Diploma or GED	28.20	16.40	16.43	18.54	18.99	.0121
Special Ed. Diploma	14.79	19.02	15.19	21.22	18.28	
Some College	7.40	3.53	3.34	2.83	3.89	.0005
College Graduate	1.93	1.30	.92	1.12	1.26	

This table also shows that when considering facility size, small facilities evidenced a higher percentage of clients with a high school diploma as their highest level of education, and also a higher percentage of clients who had completed some college. This suggests that the educational level of clients within the small facilities was higher than in the larger facilities.

Client skill training data was consistent with the above. Most clients (86%) had no skill training prior to entering the facility. Five percent each had some prior skill training and prior vocational/technical studies. Facility size analyses showed that small facilities had higher percentages of clients with apprenticeships or vocational/technical studies, and a lower percentage of clients with no prior skill training.

Referral Sources

The results of analyses of client referral sources showed that, across facility size, State Vocational Rehabilitation Agencies were by far the largest referral source, accounting for over half (52%) of all client referrals. No other single source accounted for more than 8% of total client referrals.

Facility size analyses showed that the relative percentage of referrals from State V.R.

Agencies was significantly higher in small facilities than in the larger sized facilities. In fact, the caseloads of small facilities reflected approximately a 50% higher relative referral rate from State V.R. Agencies than was the case for large facilities.

Referral source tabulations indicated that, across respondents, only five referral sources accounted for four or more percent of the clients. These were:

State Vocational Rehabilitation Agency.....52%
Developmental Disabilities Boards.....8%
State Mental Health.....7%
Self-Referrals.....5%
Special Education.....4%

Facility Characteristics

Numbers of Clients Served/Client Tenure

The average facility in this sample served 387 clients within a fiscal year. Not unexpectedly, large facilities served the greatest average number of clients — 495. However, small facilities served the next largest mean number of clients per year — 432.5. Medium-large facilities showed the lowest mean. This shows that both large and small facilities served the greatest number of clients per year.

Table 3

Total Number of Clients Served Per Year, and Length of Client Stay at Facility

Size of Facility	# Clients Served Per Year	# Days At Facility
Small	432.5	58.89
Small-Medium	335.9	157.13
Medium-Large	274.3	177.83
Large	495.0	176.36
Average	387.0	151.85

The second column of Table 3 sheds some light upon this pattern. It clearly shows that the average number of days clients spent at a facility was very similar across different sized facilities, except for small facilities. The overall average number of days clients spent at the facility was about 152 days. For small-medium, medium-large, and large facilities, these means were very similar, ranging from to 158 to 178 days. But at small facilities, clients stayed a significantly shorter average of 59 days. This explains the large numbers of clients served by small facilities. Small facilities had a much higher rate of client turnover.

Fiscal Information

Using some established accounting principles, seven possible sources of facility income were established. The income for each of these categories is listed on Table 4.

As can be seen, the average total yearly income for all facilities was $768,988. Two categories of income accounted for 89% of total facility income — Fees for Services ($347,439) and Earned Income ($336,339). Amounts of other income were: Subsidy Income ($50,363); Special Grants and Projects ($15,868); Tax Support ($8,403); and Interest Income ($2,223). "Other Income" accounted for an additional $8,353.

Table 4

Fiscal Resources (in Dollars) of Responding Facilities (Across Different Size Facilities)

SOURCE OF FUNDS	AVERAGE INCOME
Fees for Services	$347,439
Earned Income	$336,339
Tax Support	$8,403
Interest Income	$2,223
Subsidy Income	$50,363
Special Grants and Projects	$15,868
"Other" Income	$8,353

Facility size effects on total facility income were also found. The means for total facility income were: Small Facilities - $410,538; Small-Medium Facilities - $338,883; Medium-Large Facilities - $1,356,274. This pattern indicates that Large Facilities had a distinctly and significantly higher total level of income than the three small size groups of facilities. (The three smaller sized groups of facilities did not differ significantly from each other). This pattern may reflect the greater range of facilities, in terms of size, within the large facility group.

Staffing of Facilities

Three general categories of staff were assessed. As shown in Table 5, client services staff accounted for the largest number of staff within the facilities, with about 25 such FTE staff being the average. Management staff averaged six per facility, and support staff averaged about four. When considering facility size, large facilities showed significantly higher means for all three categories of staff than the three smaller size groups.

Table 5

Staffing of Facilities Grouped into Three Major Categories (in Full-Time Equivalents -- FTEs)

	FACILITY SIZE				
STAFFING CATEGORIES	SMALL	SM-MD	MD-LA	LARGE	AVER.
Management Staff	3.20	4.52	5.27	9.45	5.96
Client Services Staff	9.89	16.01	26.02	41.26	24.86
Support Staff	1.92	2.60	3.67	6.22	3.83

CARF Accreditation Patterns

Since facilities were selected to meet the inclusion criteria for the present study, accreditation patterns do not reflect national patterns of CARF accreditation.

In this sample of facilities, the following percentages of accreditation were found:

Vocational Development.....72.3%
Sheltered Employment.....56.9%
Work Activities.....50.9%
Personal/Social Development....11.8%
Speech Pathology.....2.7%
Audiology.....0.7%

Only Sheltered Employment and Work Activity showed any significant effects for facility size.

These are shown on Table 6. The percentage of large facilities accredited in Sheltered Employment was significantly greater than the corresponding percentage for small-medium facilities; and the percentage of large facilities accredited in Work Activity was significantly greater than the corresponding percentages for both the small and the medium-large facilities. These patterns indicate that large facilities seemed to be more oriented toward Sheltered Employment and Work Activities than small facilities.

Table 6

Means Comparisons, by Facility Size, of CARF Accreditation in Sheltered Employment and Work Activity (in percents)

AREA OF ACCREDITATION	FACILITY SIZE SMALL	SM-MD	MD-LA	LARGE	AVER.	SIGN.
Sheltered Employment	48.57	49.28	51.02	73.13	56.82	=.01
Work Activity	11.43	56.52	42.86	71.64	50.91	<.001

Availability of Programs/Services

The absence or presence of 19 categories of programs/services was also assessed within the responding facilities. Results are shown on Table 7.

Table 7

Availability of Programs/Services Within the Facilities in the Sample (in Percents)

PROGRAMS/SERVICES	FACILITY SIZE SMALL	SM-MD	MD-LA	LARGE	AVER.	SIGN.
A. Vocational/ Work Evaluation	68.5	78.3	81.6	85.3	82.8	
B. Psychological Testing	31.4	35.3	25.0	42.7	34.7	
C. Vocational Counseling	60.0	57.4	68.8	75.0	65.8	
D. Personal Counseling	37.1	47.1	54.2	55.9	49.8	
E. Social Services	14.3	23.5	37.5	26.8	29.2	.0500
F. Remedial Education	25.7	39.7	43.8	50.0	41.6	
G. Work Adjustment Training	71.4	79.4	85.4	85.3	81.3	
H. Occupational Skill Training	20.0	16.2	41.7	51.4	34.3	.0001
I. On-The-Job Training	25.7	22.1	35.4	26.5	26.9	
J. Job Seeking Skills Training	54.3	60.3	64.6	69.1	63.0	
K. Job Placement	48.6	58.8	75.0	80.9	67.6	.0017
L. Sheltered Employment	42.9	69.1	66.7	77.9	67.1	.0741
M. Work Activities	20.0	55.9	66.7	82.4	60.7	.0001
N. Independent Living	22.9	20.6	43.8	36.8	31.1	.0258
O. Daily Living Skills	28.6	41.2	62.5	60.3	49.8	.0021
P. Residential Living	14.3	14.7	20.8	19.1	17.4	
Q. Recreation	22.9	26.5	45.8	41.2	34.7	
R. Medical Services	20.0	10.3	22.9	30.9	21.0	.0311
S. Other	11.4	7.4	16.7	17.6	13.2	

Consistent with the CARF accreditation patterns mentioned previously, the two most frequently offered programs were Vocational/Work Evaluation (82.8% of the facilities) and Work Adjustment Training (offered by 81.3% of the facilities). The remaining programs, evident in 50% or more of the facilities, were:

Job Placement.....67.6%
Sheltered Employment.....67.1%
Vocational Counseling.....65.8%
Job Seeking Skills Training..63.0%
Work Activities.....60.7%

Facility size effects suggested that, on many of the comparisons, the percentage of facilities offering a specific service/program tended to increase with facility size. Large facilities tended to offer a wider array of services/programs than the smaller ones. This seems consistent with the larger numbers of staff and also clients found within the larger facilities.

Implications of the Results

The results which were obtained help to clarify the structure of a national sample of vocationally oriented CARF accredited facilities, and can be used to address some of the issues pointed out above.

The above data were collected in the three primary content areas of clients, referrals, and facilities. Additionally, the data were analyzed by facility size because some of the characteristics were skewed by the numbers of clients served by the facility. Thus, the implications of this study will be examined using four focus areas:

1. Client Characteristics
2. Client Referral Sources
3. Facility Characteristics
4. Size Related Characteristics

Client Characteristics

With an overall average of 51% of the clients in this study having a primary diagnosis of mental retardation, two approaches appear to be open to facility service planners. Facilities may choose to sharpen their marketing strategies with these clients, promoting services to mentally retarded clients as a primary specialty area. On the other hand, facility planners may be wise to broaden their service base to provide services for other disability populations, particularly populations that have service needs closely allied to the services provided mentally retarded clientele. The most successful strategies will probably incorporate elements of both approaches. Facilities can specialize their services and provide these services to many populations.

This study found that 77% of facility clients were white. The prevalence of disabilities within minority populations has not been found to significantly deviate from the norm. Thus, at least within the limitations of this study's sample, minorities seem to be under-represented in facilities. More investigation needs to be conducted to determine if facilities should implement an affirmative action plan aimed at providing services to minority populations. In any case, this may be an overlooked market for facility services.

Most facilities were found to be serving 19-40 year old, "career age" clients. This is not surprising considering the vocational emphasis of rehabilitation facilities. However, significant markets also exist for clients in the under 18 and over 40 age groupings. In our discussion of size specific characteristics below, we will note that some facilities have seen these market potentials and acted to boost client loads.

Given the populations served, findings showing an educational level of less than a high school diploma for 58% of the clients in facilities is not surprising. However, this client

characteristic may significantly shape the curriculum development of facility programs. In addition, some of the curriculum elements designed to address educational deficits may provide market openings for the facility.

Client Referral Sources

Overall, facilities received an average of 52% of their client referrals from vocational rehabilitation agencies. Only five sources individually provided more than 4% of facility referrals. However, an average of 24% of facility referrals were received from a diverse base of sources. This fact is of significant interest considering the threats of budget reductions within the state/federal rehabilitation system in the near future.

Presently small, but potentially important sources of client referrals include private industry councils, insurance carriers, public school programs, and other rehabilitation facilities. The latter source is very interesting. The fact that this source is mentioned by reporting facilities at all shows that specialization can even create an inter-facility network leading to better service provision for clients and a larger referral reach for facilities.

Facility Characteristics

Fees for services and earned income tend to account for equal shares (and the largest percentage) of facility operating revenues. Administrators of facilities have heard for years that the balance of fees verses earned income needs to be restructured to weight heavily to the earned income side. Certainly some shift in this direction is to be expected. However, it is not undesirable to strive for continued balance in these two areas by identifying and soliciting clientele from other market areas. A fees for services - earned income balance may, in fact, help keep the facility's mission clearly in focus.

Client service staff were found to account for the largest number of employees in facilities. This should be interesting to many staff members who often criticize the number of management related personnel in their organizations. Generally, the staff to management ratios was reported at four to one. Also interesting was the data for support personnel. Though greater specialization may influence these figures, this study indicated that the client service staff to support staff ratio normally averages six to one.

Size Related Characteristics

Most characteristics skewed on the basis of size were found in small facilities. Some characteristics of large facilities could also be related to their size. Lower per day client counts could possibly account for their apparently non-traditional approach to marketing their services.

Small facilities had several marked characteristics. Small facilities served a larger variety of disabilities; they served larger numbers of non-mentally retarded clients; they served the largest number of clients under 18; they served more educated clients; they had the highest percentage of vocational rehabilitation referrals; and they had high per year client counts, but kept them on their case loads for half the time of all other facility categories.

These characteristics of small facilities point to market flexibility. Larger facilities should also be able to provide small-facility-like flexibility through a greater use of service specific control centers. Creating program structures that give service supervisors more acting authority (with attendant responsibility) may help these facilities gain the flexibility needed to compete for many service and clientele markets.

Large facilities also were found to have characteristics that were significantly different from the average. Large facilities served highest percentage of mentally retarded clients. They also, perhaps because of their clientele base, relied heavily on locally based DD boards for their referrals. As a final consequence of their client population, they also tended to provide sheltered employment and work adjustment services as primary providing programs. From this base, large facilities are in a good position to specialize in services to mentally retarded clients and in the service areas of sheltered employment and work adjustment for other disability referrals. Any diversification of their services should be attempted using either the above characteristics as a benchmark or through the use of highly autonomous program centers as described above.

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VOCATIONAL EVALUATION: COMMON CRITICISMS AND THEIR AFFECT ON FUTURE OPPORTUNITIES

JULIA EDGCOMB

Abstract

People outside of rehabilitation generally have never heard of vocational evaluation, but they are becoming increasingly aware of a need for the services we are qualified to provide, and are finding people outside of our profession who are more than willing to fill this perceived gap. If vocational evaluation as a profession is going to grow, it is necessary that we as a group take it upon ourselves to proclaim our existence and back ourselves up with proof of our expertise. In order to do this we will have to look at ourselves, categorizing our positive attributes and correcting our negative ones. We will also have to analyze the systems outside of rehabilitation and adjust our services to meet their needs and the needs of the clientele. Criticisms of present evaluation practices are presented in this article, followed by discussion of areas that will require vocational evaluation in the future.

Enormous opportunities exist now for the profession of vocational evaluation. People are looking for the services and expertise that vocational evaluation specialists offer, but too frequently they are not aware of the existence of our profession, so the void is being filled, or is in danger of being filled, by other professionals who have transferable skills they feel qualify them to do our job. School counselors, psychologists, social workers, personnel clerks, teacher aides and occupational therapists are doing vocational assessment and evaluation now, and if we are to maintain our integrity and credibility as a profession it is incumbent upon each of us to make the effort to strengthen our professional image and accessibility.

My experience has led me to conclude that the situation sould be attacked by professional introspection and self criticism in combination with the development of aggressive marketing and training programs.

Historically vocational evaluation has been a part of the vocational rehabilitation process, taking place in sheltered employment settings and, more recently, in private for profit rehabilitation centers serving injured individuals in third party payment situations. Many evaluators have a limited, tradition bound view of what constitutes a proper evaluation, and have become rigid in their willingness to individualize evaluation programs to meet the needs of different populations. Quality of evaluation has, in some places, been judged by length of time alloted instead of by looking at the client's work potential, goals, physical situation and needs.

If we as a profession choose to respond to requests for our services from areas outside of rehabilitation, we have to take the time to study their systems and needs, as well as our own, to produce an evaluation product that adheres to our standards and ethics, complements and meets the needs of the systems we are serving, and culminates in a positive evaluation experience for each client.

First we must look to ourselves. In the State of California, certified, qualified vocational evaluators are hard to find. However, vocational evaluation is used extensively in that state, in rehabilitation, in education and in job training programs. The apparent lack of qualified evaluators has produced a system that allows people with no qualifications as evaluators to be hired as such, with a B.A. in Psychology, Spanish-English bilinguality or similar criteria considered as acceptable to learn our profession on-the-job. Vocational Evaluation is in danger of losing its professional credibility, especially as long as silence is maintained about this O.J.T. evaluator perception. Silence indicates acceptance, which should not be the case.

In fact, one of the prevalent criticisms of evaluation is that we are allowing our work to be done by unqualified people. Vocational evaluators must develop some professional pride, and vocalize it, or they are in danger of losing their profession to others who have the vision to see the need for these services (not to mention the profitability).

Another prevalent criticism is directed at the increasing number of "canned" reports. In an effort to streamline process, and keep up with the times, many evaluation centers and some evaluation equipment manufacturers have programmed report formats. Much of this work is excellent and has helped working evaluators to save time in report writing. Unfortunately, these programs can be, and are being, abused. One facility of my aquaintance has required staff to use a 40 page boilerplate report format, that fundamentally purports to meet every potential vocational evaluation reporting nuance. This facility works with clients who fall in a wide variety of categories and such over-reliance on form, as opposed to individualizing content, is inappropriate to our profession.

It also presents to the referral source the illusion that the only skill required in writing a vocational evaluation report is the ability to fill in the blanks and mark multiple choice boxes. Obviously, this type of professional presentation is contributing to our picture as a non-profession, not to mention the dis-service done to the evaluee.

Burnout has become a popular topic. There is no question that vocational evaluators work very hard and we are constantly required to make decisions and produce in deadline situations. This is the nature of the profession. It can be easy to slip into a grind-out clients and reports routine in a manner that is convenient to facility staff, as opposed to considerate of client expectations. It seems that the evaluee's perception of the evaluation, and its importance in their life, is considered less than it should be. Staff people I work with have found that moments of empathy, of putting oneself in the evaluee's place, do wonders to remind them of why they are doing the work they are doing and, ultimately, for whom. The lessons of Stanley Milgram (1974), and Phillip Zimbardo (1973) are as relevant to vocational evaluation as they are to social psychology.

While criticism is being discussed, the perception of vocational evaluatin as a tool to screen people out of the rehabilitation process, as vocationally "non-feasible", comes to mind. This perception was so strong in one section of California that the applicant's attorneys banded together and prevented the use of vocational evaluation with their clients. Apparently centers in that area had been using lack of education, lack of English fluency and lack of physical pain tolerace as a base for recommendations that the person was not feasible for rehabilitation services. This resulted in the consistent loss of rehabilitation benefits for a specific section of the population. When the problem became evident the evaluators involved refused to discuss the matter with the attorneys, standing on their right to make professional decisions as they saw fit. This resulted in the destruction of the evaluation service in that area which, had it been allowed to spread, would have had major negative impact on our profession and on the client's right to receive our extremely valuable services. This situation evolved, at least in part, because of rigidity and arrogance on the evaluator's side coupled with an apparent lack of concern and creativity when working with a difficult population.

As was briefly alluded to earlier in the article, burnout has as a side effect the tendency to insist on client's meeting evaluator's needs instead of vice versa. If an evaluator, as a human services professional, makes a commitment to provide services for a given population, it strikes me as unethical to then turn around and deny service to that population on the basis of their limitations, which are the reason they require your service in the first place. In third party payment situations the temptation to view the payer as the primary client has to be resisted. Opportunities now exist outside of rehabilitation for the field of vocational evaluation. As a Californian, this author will confine discussion to that State, with the reminder that California is considered one of the five bellweather (Naisbitt, 1982) states in the country, so as we go, so will everybody else (unless they learn from our mistakes!).

Through no effort of V.E.W.A.A., or any professional evaluation organization known to this author, California's new Workfare law requires that a vocational assessment be conducted on all eligible welfare recipients who are going to be referred to on-the-job training, education, vocational education, supported work, grant diversion, and short term pre-employment preparation programs. The law requires that welfare recipients with children over six years of age register for the State Work program (G.A.I.N. - Greater Avenues for Independence), and it is all these people who will be participating in vocational assessment. This program is being coordinated by the State Department of Social Services and each county will be finding its own method of G.A.I.N. implementation and program development. California VEWAA is now in contact with some of the principals involved in G.A.I.N. implementation, on C-VEWAA's initiative, but it is still possible that a statewide vocational assessment program could be put together, involving millions of clients, with no input from the vocational evaluation profession. Ronald Reagan's administration has already announced and shown a strong interest in California's Workfare program, so expect this trend to continue nationally.

Another federal program that involves vocational evaluation is the Job Training Partnership Act (J.T.P.A.), through which millions of economically and vocationally disadvantaged persons are being funneled in an attempt to gain employment. It is my understanding that evaluation is underutilized in this system, and that therefore a situation again exists where people who could benefit from our services are not receiving them, because of a combination of ignorance, limited funding and lack of qualified available personnel.

Federally, again, is the Carl Perkins Act, which states that "an assessment of interests, abilities and special needs" must be provided to

each handicapped or disadvantaged student that enrolls in a vocational education program. In this evaluator's experience, vocational assessment in educational insitutions is performed by teacher aides, career center aides, librarians or teachers whose specialities have been cut from the curriculum but whose contracts have ensured tenure. Where is our professional voice? Psychologists do psychological testing, Doctors do medical testing; why do we allow the perception that anyone off the street can qualify to do vocational testing?

In 1981, California initiated a state law mandating that either party, or the judge, in a divorce case where a dispute exists about the quantity of the spousal support award, can request or order the vocational evaluation of either, or both, parties. This work generally involves interviewing, transferable skills analysis, testing and report writing, as well as availability to testify in court. The qualified vocational evaluator again is the natural person to perform the service, but ignorance of our existence has led to the hiring of self proclaimed vocational counseling experts. Another example of potentially lost opportunity for our profession.

So far this paper has given examples of areas where our services are needed, in which we have not been traditionally involved. Other such areas include an expansion of our involvement in the Social Security system, as well as in a myriad of personnel and employee assistance capacities. The work is out there - the question is whether or not the profession of vocational evaluation is up to doing it.

In my opinion, at this point we are not, but we can be in the very near future. I would call upon the schools that train to intensity their recruitment efforts and broaden their curriculum. I believe that enrollment would jump significantly if students were told of the variety and potential offered through the profession of vocational evaluation.

Our professional organizations also have to address the issues of professional qualifications and of new markets. In California, vocational evaluators have been discussing the need for an organization that speaks for Vocational Evaluation as a whole, not only as part of a rehabilitation process. On the other hand, nobody wants a new organization if our present ones show the vision and flexibility to grow with the times.

Individual Vocational Evaluators in many states are working hard to upgrade services and branch out in new directions. These people need to be supported and need to feel a bit less solitary in their efforts. These people will be providing services and setting the standards by which our profession is measured. It is the hope of many of these forward thinking and acting individuals that our profession will take a loud position on our standards and ethics, in the manner of the A.P.A. and the A.M.A. Effective lobbying and marketing efforts over the next few years will be crucial in either establishing vocational evaluation as a viable profession, or in allowing our professionalism to erode away bit by bit because of a lack of established presence.

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A Market Orientation to Vocational Evaluation

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ABSTRACT

The need for, and goals of, vocational evaluation of industrially injured workers within the Workers Compensation system are specific to this system. The vocational evaluator is accountable to the injured worker (and his attorney), the rehabilitation counselor and the insurance adjustor. In order to meet these varying needs, the importance of feasibility determination, flexible services, and the need for close communication with the rehabilitation counselor are discussed. Decision points, and appropriate services are discussed.

The need for vocational evaluation of the industrially injured may seem self evident to evaluators. To the private sector rehabilitation counselor these needs may be counterbalanced or overcome by the demands of the system, lack of precise information of services evaluators can provide, or inflexible evaluation services.

The majority of private sector referrals come from rehabilitation counselors who must account for the time and expense of evaluation to insurance adjustors. Other referral sources may be self insured employers, or applicant's attorneys. The needs of the insurance adjustor may be summarized as follows: 1. Services must be time and cost effective. 2. Answers to key questions must be answered and accurate conclusions drawn. The insurance adjustor typically judges the success of a case on the dollar cost of rehabilitation. (Gianforte 1982) Key questions for the adjustors are usually quite simple, 1. Can the injured worker return to work? (Is s/he feasible?) 2. Doing what? 3. Is s/he motivated and cooperative? In many states the potential future earnings of the injured worker are of critical importance in determining the final cost of case settlement. This often is an important concern to the applicant's attorney and insurance adjustor. The need for objective and accurate evaluation in an adversarial and often highly emotionally charged arena can be a special challenge to evaluators new to the private sector.

The public State-Federal vocational rehabilitation system has as its goal the maximization of the handicapped individual's vocational potential. Typically, time constraints are not as pressing as in the private sector. One wit summarized the differences between public and private rehabiliation in California by stating "Public rehabilitation has time and no money; private rehabiliation has money, but no time." The precise goals of private sector rehabilitation vary from state to state. They may be roughly summarized as returning the injured worker to competitive employment as quickly as possible and replacing wages as nearly

as possible. Notice the goals are less idealistic, more practical and the "bottom line" is clearly stated.

Some of the implications of private sector evaluation for the evaluator are clear. First of all, when the question is can the injured worker return to work (is s/he feasible), the evaluators answer should be correct and clearly stated. This is often a difficult task. Secondly, if there is a disagreement among the various parties, the evaluator is accountable to justify the conclusions drawn, perhaps in a court of law. For the injured worker, a "false positive", or judgement that s/he is feasible when s/he is not, can result in lost settlement dollars. For the insurance carrier this can result in wasted rehabilitation funds. A "false negative", or judgement that the injured worker cannot work may relegate him/her to life without work, a lower standard of living, and loss of assistance in returning to work. The social implications for the community at large, of either money or lives wasted, make creativity and professional stature especially important to the evaluator.

Feasibility, or determining whether an injured worker can return to work, is an amazingly complex issue. The variables are enormous, the contexts both varied and critically important, and there is no clear consensus on what this means. At Occupational Assessment and Modification where author Patricia C. Smith is Director, the primary considerations are safety, followed by physical tolerance - the ability to complete a full eight hour day while engaged in work activities at a competitive level. These two factors may independently lead to a nonfeasibility determination. For example, the injured worker who can only complete two hours of even the lightest work is clearly nonfeasible. Likewise, the worker who falls repeatedly or endangers him/herself or others in the work place is nonfeasible.

Other lesser factors which may lead to a nonfeasibility determination in combination with the first two, or in combination with each other are worker characteristics, academic skills and aptitudes, motivation, and output.

Worker characteristics may include punctuality, interaction with authority figures, ability to stay on task, work style, grooming and dress, and so on. The worker who is late every morning and coming back from lunch every day, or who refuses to participate in evaluation may be nonfeasible, to suggest an extreme example.

Academic skills and aptitudes do not usually play so critical a role in feasibility, but may be an additive factor. An example would be the functional illiterate truck driver with a learning disability who must work within greatly restricted physical limitations. If the local labor market will not support work within his physical limitations for which appropriate training is available, he may be nonfeasible.

Motivation is a catchall term which should be clearly defined in behavioral terms or eliminated from reports altogether, depending upon the referral source and audience of the report. Everything from worker characteristics such as punctuality, to the depression associated with not yet accepting ones disability, may be covered under this broad term. For the rehabilitation counselor and especially for the insurance adjustor, the key to this is "Does the injured worker want to work and act like it?" The person who clearly states "I don't think I can work" and who does not complete tasks would be said to be unmotivated, perhaps even nonfeasible. A more difficult example often seen is the injured worker who has a thousand good reasons for not completing tasks, following through with the sometimes difficult decisions to be made or who does just enough to stay in the system, but not enough to go back to work.

Output is a reference to the amount of work performed. Competitive levels of output vary from industry to industry and from vocation to vocation. Norms may be obtained from local industry standards, job analyses, or from local employers. An example of a vocation requiring high output would be electronic assembly, within the same industry VCR repair would not require the same high output. Output would be

far less likely to lead to total nonfeasibility than to eliminate certain specific vocational goals.

An important distinction which should be stated clearly, especially in reports, is that the injured worker may be feasible for some jobs but not others.

Two other important points to consider are the local labor market, and trends within the evaluation. The vocational evaluator should have a competent knowledge of the local labor market and requirements of the various jobs. This should include physical tolerances, academic levels (math and reading, etc.) and other requirements. Trends within the evaluation can be very important. For example, the worker whose physical tolerances increase over eight to ten days to just short of competitive employment level would probably be feasible. Work hardening should probably be considered, and if warranted, commented on or recommended in the report. The injured worker with decreasing physical tolerances may be nonfeasible.

Typical criticisims of vocational evaluation are that it is time consuming, costly and yields incomplete or vague results. Feasibility, the issue just covered, is central to the concerns of most referral sources. Time, as stated earlier, is money to the insurance adjustor who is responsible for both the cost of evaluation and living expenses of the injured worker. One of the most important considerations to both the private rehabilitation counselor and insurance adjustor is the length of the evaluation and time before the report is received.

Another point to consider is that the private rehabilitation counselor usually has at his/her disposal at least a small battery of paper and pencil tests and fine motor skills tests. The ABLE and Crawford Small Parts Dexterity Test are typical of these. With these results and clear medical reports the private rehabilitation counselor may avoid referral to the vocational evaluator altogether. To serve the private sector well, the vocational evaluator must respond to the time and cost restraints of the system and provide more or different services than the rehabilitation counselor has available in his/her office.

The evaluator has the advantage of a more complete battery of tests, vocational simulations, and the opportunity to observe the injured worker over longer periods of time. These and other resources may be capitalized upon by providing what Mason (1985) calls a hierarchy of vocational evaluation services. These will be summarized as follows.

Specialized services which may be provided in one day are computerized vocational screening or transferable skills analysis using one of the systems similar to VDARE, now available. Typical paper and pencil testing and interest testing may be performed reasonably soon after the industrial injury to expedite a return to work when the residual disability is fairly clear and a change of occupation is anticipated.

Work tolerance and feasibility testing usually follows full recovery or permanent and stationary medical status, except in the case of specific skills not handicapped by the injury. An example would be hand-eye coordination and fine motor skill testing in the case of a knee injury. Work tolerance and feasibility testing may also be appropriate in the case of reinjury, change in medical status, or following unsuccessful job placement.

Long term feasibility evaluations are especially useful when the injured worker is physically deconditioned by being out of work for a year or more. These are also particularly useful when motivation is poor, or not demonstrated, in order to document this and worker characteristics, or with illiterates or non-English speakers for whom standardized paper and pencil tests are not appropriate. This also provides the injured worker with the "experiential component" of demonstrating to him/her self his/her own experience of physical tolerances and other vocational capabilities. (Nadolsky 1983)

Once the evaluation is complete, or when physical tolerances are well known and the employer is receptive, work place modifications may be recommended or in some cases performed by the

vocational evaluator. This area of expertise is traditionally provided by occupational therapists.

The written report should be jargon free, not unduly long, and draw conclusions clearly. The vocational implications of various evaluation instruments and results should be clearly explained. One cannot expect the rehabilitation counselor, insurance adjustor, or applicant's attorney to be familiar with all or even part of the instruments used. One further cannot expect the rehabilitation counselor to synthesize unfamiliar data and draw correct conclusions. Conversely, the evaluator should be careful not to overstate his/her knowledge, expertise, familiarity with the local labor market. It is important to state clearly that a nonfeasibility judgement based on a lack of employment possibilities is based on just that. Perhaps the rehabilitation counselor has more information or a different approach that would allow the injured worker to work at some job unfamiliar to the evaluator.

The need for close rehabilitation counselor and vocational evaluator collaboration is critical. It is up to the evaluator to instruct the counselor in how to ask answerable questions. In general, rephrase abstractions such as motivation or ability into behaviorally defined terms. Clear communication is necessary because vague referral questions often lead to vague evaluation results. What may be acceptable and understandable to the injured worker and rehabilitation counselor may not be understandable to the employer or insurance adjustor who pays for the evaluation.

It is incumbant upon the vocational evaluator to know the expectations of the larger audience of his/her reports, the applicant's attorney and the ultimate source of referrals, the insurance adjustor. One way to clarify these expectations is to call on these people and to discuss their expectations and perceptions of vocational evaluation. By addressing the needs of all parties to vocational evaluation, the evaluator may better serve the rehabilitation community, the injured worker, and the referral source.

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DATA BASES AND VOCATIONAL DECISION MAKING

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Abstract

As vocational assessment and evaluation become increasingly sophisticated and computerized, many professionals are turning to a variety of software based on or derived from data obtained from the U.S. Department of Labor's Dictionary of Occupational Titles and related publications. There are numerous problems with the continued usage of the DOT as the sole data base: (1) DOT data collected between 10 and 15 years ago; (2) lack of quality in the job analyses, (3) lack of consistent data collection methods; (4) not enough job analyses of provide adequate coverage; (5) sampling problems in selecting jobs for study; (6) serious problems with structure of worker trait profile; and (7) problems with transferrable skills.

Evaluators, placement specialists, vocational experts, and disability determination personnel need a dynamic data base. The specific needs include the following: (1) a flexible data base that is constantly being updated; (2) a flexible structure to interface this data base with users; and (3) the availability of locally developed data bases.

There is no projected date for a revised DOT, let alone an interactive data base. Because not much is being done in this area, now is the right time to rethink some basic concepts that we have all accepted and to prepare for the future. It is time that the following steps be taken: (1) make users aware of the problems with the data base, this includes the legal community, industrial psychologists, vocational guidance counselors as well as rehabilitation professionals. (2) Organize a national conference to discuss what to include in any data base. For example, expanded sets of physical demands and environmental conditions would be very useful in vocational rehabilitation and disability determination. (3) Enlist the aid of the three national administrations that use the DOT the most: Social Security Administration, Veterans Administration and the Department of Labor. (4) Organize a small task force of consumers of data and job analysis experts to consider the real needs. (5) Develop practical methods for collecting job analysis data, and (6) Develop local job banks.

Today I want to talk with you about data bases in general, the data base for the fourth edition of the Dictionary of Occupational Titles (DOT) in particular, and the relationship of these two factors to vocational decision making; especially vocational decision making using one of the computerized job matchings systems.[1]

As vocational evaluation and assessment become increasingly sophisticated and the provision of services more competitive, many evaluators and vocational experts have started using one or more of the various computerized job matching systems that have recently become available. Unlike Athena being born fully armored from the head of Zeus, these computerized job matching systems did not suddenly appear fully developed. Nor were they totally new concepts. I remember when first coming to Stout in 1972, Dr. Darrell Coffey was teaching client-job matching with a set of forms he developed while employed as an evaluator at Omaha Goodwill Industries in the late 1950's.

There were at least three published manual job matching systems available by the late 1970's and early 1980's, two American and one Canadian. The most popular was the VDARE system initially developed by Drs. Timothy Field and Jack Sink (1979) at the University of Georgia. A graduate student of theirs, Dr. Billy J. McCroskey and Dr. Eugene Perkins, at St. Cloud State in Minnesota, developed the McCroskey Vocational Quotient System, copyrighted in 1981. Both of these systems published large volumes (i.e., The Classification of Jobs (Revised Edition) and The Encyclopedia of Job Requirements) containing listings of Worker Traits and Job Classification codes for each job in the fourth edition DOT. These data, obtained from U.S. Department of Labor tapes of the job analyses used to develop the DOT, became the first readily available information on the job characteristics of individual occupations as defined in the fourth edition of the DOT. It is interesting to note that these two publications were developed privately, without DOL cooperation or funding. Although more a career exploration system than a strict

1. I wish to thank Mr. Carl Anson of the Office of Disability, Social Security Administration and Mr. John Hawk of the U.S. Employment Service, Manpower Administration for reviewing this paper. I also accept full responsibility for any errors in this paper.

job matching, the Canadian Employment and Immigration Service developed a very sophisticated guidance device titled "Index to Canadian Occupations" (Occupational and Career Analysis and Development Branch, 1979). It must be mentioned that there are presently computerized versions of these three systems available: the Job Search Program, Datamaster, and CHOICES, respectively.

If you have even spent two or three hours performing a manual job matching search using either VDARE or the McCroskey process, you know what boredom is. It was no wonder that when these processes as well as others were placed on computers, they were initially very popular and continue to be popular. By early 1983 there were about eight systems on the market; today there are somewhere around 15. The development and spread of these systems is, if anything, greater than the expansion of commercial work samples in the middle 1970's.

All of these job matching systems have one thing in common: their data bases are either directly or indirectly taken from the U.S. Department of Labor computer tapes containing job analysis data used in the fourth edition of the DOT. Even those systems having the option for developing local data bases still require the user to enter local job analysis data using the standard DOL variables (e.g. General Education Development, physical demands, and temperaments). With the exception of the new Isabel System (Florida Occupational Information Coordinating Committee, 1984), I cannot think of any job matching system that is not based on DOL terminology, if not on DOL data. Although all of these systems have at least slightly different logic and each is unique in its own way, they all share the same set of variables and in many cases the same data base. It is this data base that I want to focus on today.

Most of us have been trained to use the DOT and related documents, such as the Guide for Occupational Exploration (Harrington and O'Shea, 1984), in graduate school; many of us use these documents daily in evaluation planning, occupational information, vocational counseling, report writing and testimony. Although the DOT is a very useful document, or is the only nationally available source of job definitions, there are numerous problems with the continued use of the DOT as the only data base. Remember that I am using the word "DOT" as a shorthand for both the publication and the job analysis data base that produced the publication. Most of the following discussion was taken from Miller et al. (1980) and Elliott (1983).

1. Much, if not most, of the data base is dated. The collection of job analyses for the fourth edition began in 1966, after the publication of the third edition in 1965. Data collection continued until 1976. The fourth edition was published in 1977. It is now 1986, this makes the job analyses that are the basis of the DOT between ten and twenty years old. All of us know from our own personal experiences how much job duties and requirements have changed in the past ten to twenty years.

2. There is a considerable lack of quality in the job analyses making up the DOT data base. Some years ago the Materials Development Center attempted to obtain copies from the North Carolina Occupational Analysis Field Center of the job analyses used in the development of the fourth edition. After being refused, we contacted our Senator who reminded the field center director of the Freedom of Information Act. Several weeks later 300 job analyses arrived at Stout. They were of such poor quality that we could not use them. The tasks and element statements were not complete, the worker trait profiles were not rated, and most of the job classification codes were missing. Had a graduate student handed in one of these as an assignment, he or she would been told to start over again. Miller, et al. (1980) reported the same findings on a much larger sample of job analyses: "Job analyses were often incomplete and were most often verifications of third edition descriptions rather than new analyses" (Elliott, 1983, p. 89).

3. The job analyses procedures used by the Occupational Analysis Field Centers were not consistent. The Handbook for Analyzing Jobs (U.S. Department of Labor, 1972) was not printed until data collection was almost completed. Miller, et al. (1980) reported that many of the procedures used prior to the publication of the Handbook were not defined or disseminated to field centers in a consistent manner. However, the most serious change occurred from 1974 to 1976:

> ...analysts were directed to concentrate their efforts on verifying jobs against existing job schedules for similar jobs in other establishments or against the DOT definition if the job could be converted to a third edition code. In this way much of the time-consuming writing entailed in completing the job analyses schedule was eliminated. (Miller, et al., 1980, p. 140)

4. There simply were not enough job analyses completed to provide adequate coverage of the over 12,000 job definitions in the DOT. Sixty percent of the job definitions were based on two job analyses or less. Apparently, reviewers attempted to compensate for this weakness by using, without modification, occupational definitions from the third edition. A random sample of 307 DOT base title occupations, revealed that 81 or 26% of the fourth edition definitions were identical to those in the third edition (Booz, Allen and Hamilton, Inc., 1979). Finally, 16% of the occupational definitions were based on no new job analysis.

5. A considerable number of questions can be raised about the sampling procedures used. The population from which the individual jobs were selected potentially included every competitive position in the American economy. Sample selection occurred at three points in the data collection: the industry level, the establishment level and the job level. At the industry level sampling procedures were based on industrial designations; these were not applied in a uniform manner. Second, at the establishment level the only consistent finding of Miller, et al. (1980) was that Field Center personnel selected establishments geographically close to the field center. Finally, "no attempt was made to observe certain types of jobs, including some professional jobs, seasonal jobs, and jobs involving a wide variety of tasks spread over long periods of time" (Miller, et al., 1980, p. 141). A critical review of the sampling procedures clearly demonstrated that retail trade and services were underrepresented; manufacturing was overrepresented. My experience with the DOT agrees with these findings; I have found that personal services, the helping professions, and business services are really underrepresented. Electronics manufacturing and repair are also underrepresented.

6. The five criticisms listed above deal mostly with procedural problems; these could be solved through the use of more careful management and consistent processes. These would not require fundamental changes in our thinking. The sixth criticism, however, lies at the heart of the DOL job analysis system. As you know, a key part of the job analysis is developing a Worker Trait Profile containing about 44 variables: DPT codes, GED, SVP, Aptitudes, Interest, Temperament, Physical Demands and Environmental Conditions. Most of these were developed in the early 1950's and were derived from the General Aptitude Test Battery, and the work of Strong and Cottle. This has resulted in a considerable amount of overlap between these variables. A factor analysis study reported in Miller, et al. (1980) using principle components with the varimax rotation method found six clearly definable factors:

   a. Complexity of Work (49% of shared variance) - High loadings on: GED, SVP, Data, People, General Intelligence, Numerical, and Verbal aptitudes and the temperaments of VARCH and REPCON.

   b. Motor or Sensory Skills (23% of shared variance) - High loadings on: Finger and Manual Dexterity, Reaching, Things, and the Machine Interest.

   c. Physical Requirement (10% of shared variance) - High loadings on: Inside/Outside/Both, Stoop, Climb, and Strength.

   d. Organizational or Administrative (5% of shared variance) - High loadings on: Dealing with People, People, and DIRECTING. This factor is related to the first factor.

   e. Interpersonal Skills (5% of shared variance) - Working with FEELINGS, INFLUENCING, and Sensory criteria.

   f. Undesirable Working Conditions (3% of shared variance) - Hazards and Atmospheric Conditions.

   My opinion is that most of these variables were developed at a time when blue collar jobs in manufacturing predominated; our switch to a service and information economy requires developing new factors centering on the interaction of people with other people and people with machines. Physical demands must also be expanded to include a greater emphasis on precise finger and hand movements, vision, and hearing. Although the A Guide to Job Analysis (U.S. Department of Labor, 1982) may contain the beginning of a new system, a much more basic reassessment of job factors is needed. The high factor loading on Job Complexity forces one to ask: how much of the job analysis ratings are really a halo effect for social status or General Intelligence (i.e. Spearman's "g").

7. The final problem deals with transfer of skills, a key element in vocational

decision making. Here I will quote from Elliott (1983) at length:

> There does not appear to be a single way of combining DOT variables that is appropriate for transfer of skill for workers of all vocational backgrounds. Using MPSMS and work fields as ways of limiting a search and transferring skill may be appropriate for a blue collar worker, but would be inappropriate for a person with a college degree (page 93).

Because the transfer of skills is both a vocational evaluation concern and legal concern, this criticism is extremely important. Although one workable approach may lie in the use of the Guide for Occupational Exploration codes, other methodologies must be developed.

These seven critical problems have undermined the usefulness of a document and data base that we all rely on; a data base used by individual evaluators, vocational specialists, vocational experts, and others to make decisions having major effects on the lives and futures of our clients. To make this even more important, it is the only available national data base of occupations.

The problems mentioned above require two separate solutions: the first is managerial and technical; the second is a critical rethinking of the basic assumptions of the DOL job analysis system. One of the most serious problems is the turn around time between a job analysis study and its incorporation into a data base. The present DOT is really a static data base that is supposed to be updated every ten to fifteen years. In a time of fast changing occupational demands and employment patterns, this is hardly adequate. A dynamic data base, kept up to date by an ongoing process of data entry and data analysis, would help to solve this problem. This data base could be used by evaluators, placement specialists, vocational experts and disability determination personnel. The specific needs are as follows:

1. Procedures for Constant Updating - As stated above, one of the most serious problems is the timeliness of the data. This could be solved by changing the DOT from a static document to a dynamic data base available to a wide variety of users. This is no dream, the technology already exists. Many of the programs needed are very close to those used by the Ability Information Systems. Based on sampling requirements, data could be entered from various segments of the economy to satisfy the sampling requirements. Although data could be entered either by direct access or mail, procedures to insure quality would have to be developed. One quality control method would be to insist that only persons trained in job analysis could submit job analyses for entry. Perhaps a panel of job analysis experts assisted as needed by advisors from various industries who know materials, procedures, subject matter, and services for their respective industries could be used. This expert panel could also request that specific jobs be analyzed.

2. A Flexible Structure for Use - Data are not useful if no one can access this information. The second requirement is that the system be user friendly and flexible. Once again, the technology already exists. Access by terminal, computer and modem, or even mail would be available for a user fee.

3. Availability of Local Data Bases - The Social Security Administration's Disability Determination Program is perhaps the only body making vocational decisions on the basis of the national employment statistics. In legal proceedings involving personal injury, workers compensation, medical malpractice, etc. vocational experts need regional, state or local data bases of existing and available jobs, not national listings. Likewise, the placement of disabled persons is usually a local matter. In order to accommodate these uses, any national system would need carefully defined subsystems for states and other geographic distinctions. Data bases combining DOT data with census codes, zip codes, Standard Industrial Classification Codes are presently available. Once again technology has increased more rapidly than our organization, administrative, and decision making skills to use this technology.

In summary, the development of a dynamic data base with local options in not a dream, the technology already exists and is already being used in a limited way. What is required is a critical rethinking of the basic concepts of the DOL job analysis methods and the political skills to make it a reality.

I will suggest specific actions that need to be taken in a few minutes, but first I must make you aware of the present status of U.S. Department of Labor job analysis activities. At the time of

completion of the fourth edition DOT, there were eleven Occupational Analyses Field Centers. A few years later, the number of Field Centers was reduced from eleven to one -- only the North Carolina Field Center was left and this one functioned mostly as a repository for data. In addition, the Division of Occupational Analysis that produced the DOT's had been disbanded with most of the older employees retiring.

From this low point, the Division of Planning and Operations has reestablished four Field Centers: Massachusetts, Michigan, Missouri and Salt Lake City. The occupational analysis operations are presently budgeted for 1.8 million. The present priorities are the retraining of staff and, of more interest, the collection of job analysis in the high tech fields, for example in computer chip manufacture and robotics. Some of the anticipated changes are sampling jobs by SIC codes instead of Industrial Designations, concentration of data collection efforts on jobs either with high turnover rates or high growth. DOL plans a two prong approach to occupational analysis: (1) data collection is to be conducted on 14 year cycles and (2) basic research on improving job analysis methodologies will be started.

Although I am very pleased for this increased concern for updating an national occupational data base, I seriously question how much can be done by the present small staff and low level of funding. However, this rather slow redevelopment of the Field Center system gives us the opportunity to rethink the entire occupational analysis procedures that most of us have used, have never questioned, and have always assumed would always be there. Because our needs as practitioners cannot wait, it is time that the following steps be taken:

1. The first step is to make all users of job analysis data aware of this problem and of its potential impact on our professional lives. This includes the legal community, industrial psychologists, vocational guidance counselors, software developers, other federal agencies, as well as rehabilitation professionals. The Social Security Administration's Office of Disability is already aware of the impact of this problem on their disability determination system and is presently studying the problem. This action could be political as well as professional; in other words, if you use these data let your federal representatives know the importance of current occupational data. Just because the Labor Department has funded four more Field Centers does not imply that a new DOT will be published in the next five or even ten years. After sufficient awareness of the issue occurs, the second step can begin.

2. Second, there should be a national conference to consider this problem, bringing together users of occupational data. During the initial stages, funding would have to obtained to cover the expense of a national conference. Prior to this conference, the assistance of a professional organization, such as the American Psychological Association, federal agencies using job analysis data, or a combination of several organizations would have to be obtained. While part of this conference would be to explore the political and legal ramifications of this problem, it would also be a forum for open discussion on the needs and specifications for a national data base. For example, should the physical demands sections be revised?

3. Sometime during the first phases of this process, attempts should be made to establish a nonthreatening working relationship with the three governmental agencies that have used the DOT the most: Social Security Administration's Office of Disability, Veterans Administration, and, of course, the Manpower Administration of the Department of Labor. I'm pressing this point because these agencies are the largest single consumers of occupational analysis data.

4. As a result of the conference and with possible federal assistance, a small task force of consumers of job analysis data and job analysis experts would be organized to consider the real needs and to develop practical solutions to these problems. This task force would begin by determining the needs of consumers of job analysis data and by relating these needs to practical solutions. This task force could act as an advisory committee to the Employment Service and the Field Centers. Whatever changes might be needed in the present system or the development of a totally new system, any system must be workable and be able to provide accurate data in a relatively short period of time. I expect that many compromises between the data to be included and job analysis methods would be made. Obviously, time and cost factors would have to be considered. Another major task would be the serious rethinking of some very basic concepts, such as:

   a. Should job analysis be replaced with a task analysis approach, such as used by the U.S. Air Force? This could result in a job-task matrix system, very

useful for training and possibly for transfer of skills.

b. It is possible that the Data-People-Things concept is overly simple? Can three scales that were never designed as rating scales realistically represent all jobs in the national economy?

c. Should the Occupational Group Arrangement, MPSMS, and Work Fields be considerably expanded to reflect changes in the national economy? How can we plan for future classification as new jobs and new industries, business and services come into existence?

d. Are the present crosswalks between DOT codes and SIC, SOC and Census Codes adequate? Are these present coding system needed at all? What would be the ramifications of having all jobs coded only in the present nine digit code, thus eliminating the other codes entirely?

e. Can a realistic method of transfer of skills be developed that would cover all jobs?

5. The product of the task force would be a set of specifications or the variables that need to be included in a job analysis. The next step involves the development of practical methods for collecting data. It is expected that several potentially useful data collection methods would be developed and then rigorously field tested. Although this research and development process could take several years, it is absolutely necessary for the long range usefulness of any system that is developed. It is entirely possible that more than one method would prove viable. By the end of the research phase, one or more data collection methods would be developed. These would have to be practical and flexible. Extramural funding and the cooperation of the Labor Department would be necessary during this phase.

6. Plans for national data collection would be developed. Because it would be impossible to develop a data base to represent the entire country at once, priorities would have to be assigned. For example, job analyses of unskilled and semiskilled sedentary and light jobs needed by the Social Security Administration for disability determination, could be analyzed first. Another good method is the one presently being considered by the DOL, i.e., concentrating on high turnover and high demand jobs. Job analysis data would be constantly revised, new jobs added, nonexistent jobs deleted, and job descriptions and requirements changed as the jobs themselves change. Beginning at this point a user fee would start to be charged; the goal is to make the entire operation self-sufficient as soon as possible.

7. Finally, using identical procedures and obtaining information for a national organization, local data banks would be developed to meet the unique needs of many users. As with the national data bank, there would be a fee for service.

This process would take several years and would require a considerable amount of either public and/or private funding and assistance to get started. The goal would be a national center, most likely a non-profit corporation or governmental agency, that would be responsible for all data collection and updating. Given current political realities, we could not expect federal help beyond a certain point. The way to avoid this problem is to establish a fee for service that would insure the update of the data base.

I hope I have presented you with a real problem that all of us will have to face up to soon. I also hope I have given you some realistic methods for solving this problem.

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MARKETING FOR INCREASED REVENUE POTENTIAL

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Abstract

Funding from grants and requests is more difficult every year, and continued service is threatened without the usual financial methods. This paper develops the topic of acquiring new financial support through marketing: (1) the differences in methods and attitudes between funding and marketing; (2) specific examples of marketing techniques used by others; (3) planning methodology to get ready for new promotions; and (4) a view of the wider assessment market available in the US for increasing revenue potential.

It is truly a pleasure and a threat to be here today. A pleasure because you apparently want to hear what I'm going to say. But a threat because I know you're desparate for funds.

The other day, I received a phone call from one of my potential customers--a rehab firm that plans to buy assessment equipment from my company. The call was from the director of program planning who said he writes grant proposals and that he had heard I have access to funding.

Well, this was a little shocking to me, because my source of funding is to sell our products to his firm and others! But I could hear his concern, so we started to talk. They had just gone through a building program, so had used up local sources of funding; JTPA funds were sewed up by local schools; his state VR office had had to cut back on funds everywhere. He had not heard about Carl Perkins, so I sent him information on that, but they were already getting referrals from lawyers and insurance companies for Worker's Comp cases. In a sentence, his well was dried up!

Schools and the rehab field everywhere have this same problem. Money from charitable sources, government and specific project grants is scarcer than hen's teeth! And the sooner we stop grumbling, accept this reality and begin to build a marketing plan, the faster we'll be back in business. It's a lot harder to do marketing, however, than to write grant proposals!

I have to tell you a little story about getting more money. It has to do with the Chicago Bears Football Team. Now I'm just making up some of the details, here, because I didn't actually hear this, but I think Coach Mike Ditka must have gathered all his players and coaches together at training camp early in the 1985 season. And he said to them, "I don't know about you fellas, but I need more money." They all agreed, because when you're in a football team that has lost more football games in 20 years than they've won, you don't exactly earn big raises! So Ditka went on, "Now the way I figure it, if we win every game this season, plus every playoff game, plus the Super Bowl, they'll give us more money. (Yeh, man)

"But that's not where the real bucks are," he continued. "The big money is going to come from marketing! If we start promoting, all the advertising companies will want to pay us for personal appearances. If the team becomes famous, we'll all get rich and famous too! The new kid we got this year--the Refrigerator--we'll put him on the offense in some crazy plays so people will begin to notice us. Then we'll get a video made of us shuffling to the Super Bowl, and...."

Well, it seems like that's what happened! Just doing their specialty (playing football) even better than before would have gotten them only a little more money. But planning a scheme to get recognized--with actions not normally done by football players--was the pot of gold. Marketing, that's where the money is now.

But what are you willing to do to get this money? It's going to be different than what you've done in the past. It will take a winning attitude, first of all. If you want something really bad, then just go find a way to get it.

I've had evaluators tell me that yes, they want to buy our computerized assessment system, but there's no money now. Well, you have to want "it" as bad as Coach Ditka and the Boys before you sit down and plan a winning strategy. When you're finally desperate, you'll find a way. And it looks like that's where we are now.

Marketing Is Serious Business

Marketing is not at all like asking for grants. For grants, you propose to an anonymous (usually) group of judges what you want to do in return for a certain amount of money. You may even overstate the funds, just in case they cut you back. And after filling out a bunch of papers, you sit back and wait because there's no action method to guarantee you'll get the money--or when.

Not so in marketing. First of all, even though you know what you want the money for, you don't go out and ask for it as such. You must rearrange your thinking: It's not that you need money; it's that other people need you to do something for them--and they'll pay you for it. And if they don't know what it is they need for you to do, you convince them. And the way to convince them is to find out where their problems are and show how you can solve them. The entire ego structure is changed around: instead of being worried about yourself, you're worried about them --their problems--because solving their problems will bring you the money you want.

Stating this in terms of the Chicago Bears Football Team: Coach Ditka didn't go to the news media and say, "The players and I decided we want more money." He said, "The Chicago Bears Football Team is going to bring a lot of publicity to the city. Instead of being the 'Second City' (to New York), Chicago is going to be so famous from what we do that it'll be known as the First City." And the news media gave him the publicity, the media got more advertising revenue, and the players got more money.

Marketing is more than an attitude change, though. It includes selling, advertising, promotion and follow-up. Instead of waiting for money to come to you, you follow up prospects--and follow up--until you have their promise and money. It's hard work!

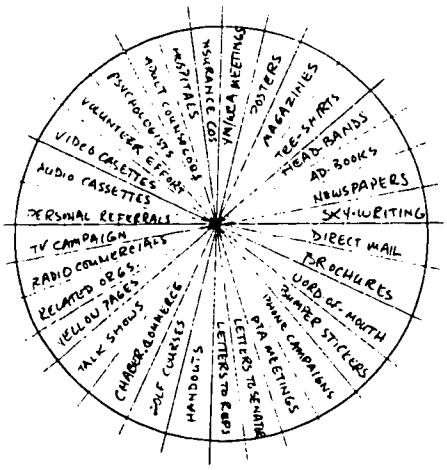
It also means changing your vocabulary--often. In our business of selling assessment tools, we've found out the term "vocation" is OK for rehab firms, hospitals and vocational schools; but it has to be "occupation" or "career" to colleges, businesses and career counselors. "Job" sometimes needs to be "position", "assessment" changed to "discovery", and so forth. If you're in doubt about words or phrases, try them out on friends or ask people in the advertising business, "which word (or sentence) makes more sense to you?"

Often, though, it's attitude, words and concepts that need studying. I'd like to show you a brochure put out by the PACE Institute located in Chicago's Cook County Jail. They wanted money to install our assessment methods for vocation in their pre-release program. But look at their brochure's front cover! "Burglary Insurance Only $22!" If they dropped these leaflets all over the country there isn't anyone who would ignore this. Furthermore, on the inside there's Jimmy Jones who pleads with open hands, "It costs only $22 to find out I can use my hands for something other than breaking and entering." And the entire pitch concentrates on saving the public from crime.

But notice the concept. They didn't ask for $2200--or the $10,000 they really wanted. They asked for $22, and they got many $22 checks they wouldn't have otherwise. They also received $220 and $2200 checks from businesses who were able to take care of more than one prisoner's potential Credit for this cleverness, however, belongs to the outstanding advertising agency J. Walter Thompson, which happens to be represented on PACE's Board. (Is there a clue here for your Board's representation?)

How Do You Do Marketing?

Start by planning. Sit down and write out every conceivable way you could get your message across. I've done it here in the shape of a wheel.



After you've thought of everything, think some more--even crazy, off-the-wall ways to publicize yourself. Notice one of the items I've shown is "headbands." This would never have occurred to me until the headband publicity stunts that were pulled by the Chicago Bears' quarterback this year. Do you know that one of his headbands worn during the Super Bowl brought in thousands of dollars to a little-known organization working with juvenile diabetes?

Plan by writing down who it is in your community that has money available. Businesses, yuppies, working couples retired persons--especially from the military. Find out who has the money, then see if there's anything you can do for them. Set up retirement day facilities, nursery centers, outplacement counseling, career planning. Again, write down every conceivable idea, whether you think you want to do it or not. The object is to look at every potential, and then cross out the unlikely ones after you've had fun teasing about them!

Study other people's marketing literature, magazine ads, publicity stunts. Write down what's

on your community's "hot-item" list; you may find popular problems you could solve by adding a service to your facility. Are there any companies in your city that are going out of business? Counsel their employees for vocation; many companies would like the positive image that they're doing everything they can for their employees.

Your Future: Jack of All Trades?

You may be confused by now. It must sound like I'm giving you information that will work with every kind of population but those you normally serve in the rehab field. Let me just state that there are tens of millions of people in the US who want and are willing to pay for "vocational rehabilitation."

They don't call it that; they say they need career advice, but all over the country we're finding they actually want a similar kind of thorough assessment as you've been providing rehab clients. And you are the only people fully trained to serve them. Today's "career counselors" do not understand the importance of assessment--especially of a person's actual ability to do a job. What they've been doing is not satisfying their clients, but they are busy inventing methods that you've got the lock and key on.

Let me also mention that if the schools are getting the JTPA and Carl Perkins funds, then the schools will be taking some of your clients. If hospitals have to get into rehabilitation assessment and adjustment just to keep from closing up, then the hospitals will take some of your clients. If colleges, prisons, career counselors, management consultants and psychologists begin to do assessments.... What is it you're going to do?

Again, you're going to sit down and plan. Look at the entire spectrum of vocational assessment and choose your specialty. When you've chosen it (or them!), begin publicity that you're the experts in your community. Tell people how you can serve them!

You may have to make some changes. Like changing your name from XYZ Mental Retardation Center to XYZ Community Center. You may have to change locations or add a storefront location for another specialty. You may need to add other specialists to your staff. You may need to change or add to your assessment tools so you can do faster screening-type assessments, such as the one we offer. You may be tempted to start your own business!

My message today? Now is the time for creative planning in the rehabilitation field. When you can't do business the way you've been doing it, it's time to re-group, re-think, re-plan. Switching from funding to marketing activities in order to do business places you in a more competitive environment. You must be sure of your goals and the services you offer. And if any of you individually need help, please call on me. Meanwhile, good luck!

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THE IMPORTANCE OF FUZZY COMPUTER LOGIC FOR CLIENT DATA ANALYSIS

Ann Williamson

Abstract

In an age where computers, rather than human beings, now compile client assessment data to produce conclusions about a client, it is imperative to understand the methods used to reach the conclusions. The computer is never working on the basis of the individual evaluator/client relationship. Rather, it works anonymously on a mass-production basis with a set number of variables. The traditional computer is set up to answer every problem variable with either yes or no: if the data input for a client meets or exceeds certain established requirements, a yes answer results; if any of the requirements are not met, a no answer results. The traditional computer, then, does not handle client data with the human flexibility of yes-but/no-but--or maybe--in reaching conclusions. It simply makes acceptance and denial statements. If fuzzy computer logic is used rather than traditional computer logic, however, client conclusions are made on a probability basis--more closely related to human decision-making procedures. Thus, the probability conclusions generated have (1) taken into account human nature's mix of high and low achievements and (2) predicted specific job performance in a ranking order, more like human decision-making. This paper is an explanation of how fuzzy computer logic reaches conclusions about a given set of client data.

This paper will concentrate on the most important aspect of computerized assessment: how the computer actually arrives at the client's vocational performance conclusions. This is not generally discussed, because apparently all computers function in the same general way: mysteriously, to the non-technician.

Let's take the case of the traditional computer, however. As you've heard, the equipment is called hardware, but what is inside doing the work is called software. We're speaking of the software when we say "traditional computer logic:" exactly what is happening to test data that's put into the computer's memory.

Traditional Logic and Vocational Decision Making

The traditional computer logic approach to vocational decision-making follows the rule that a person either is qualified or not qualified for specific vocations. Either the person passes all the criteria established for that occupation or he/she is denied access to that occupation. While this straight-line approach to job selection is easy to conceptualize, it assumes several factors:

(1) That the minimum qualifications are an accurate statement of realistic demands on the job.
(2) That all job requirements are equally important for successfully performing the job.
(3) That the job has been measured in such detail that all requirements are accurately and fully described.
(4) That the test(s) results provide a precise and accurate measurement of the factor(s) required for successful performance of the job.

In other words, the use of traditional logic assumes that all the variables have almost perfect validity and reliability derived from perfect job analysis data and assessed by perfect tests.

In vocational assessment most of us would look to the U.S. Department of Labor's occupational analysis publications (e.g., Dictionary of Occupational Titles) for the answers. Unfortunately, recently published criticisms of the DOL system inform us of many serious problems with past practices and, consequently, with the data obtained from these practices (Miller, et al, 1980).

Is it always necessary to meet all of the assumed minimum requirements for each and every job? Personal knowledge and common sense tell us that many people compensate for a lack of one skill or ability by using another. Indeed, much of the approach used to place handicapped persons is based on this concept.

What vocational test(s) has the needed degree of accuracy? Obviously, the GATB comes closest to meeting this need. Yet in spite of hundred of thousands of administrations, the GATB still

remains a poor measurement of some aptitudes (Christiansen, 1981).

Thus, when a totally accurate data base and a completely accurate assessment program do not exist, this pass-or-fail computer logic breaks down, and begins to misclassify persons into false positives and false negatives. It is our opinion that true dichotomies are not common in the real world; they exist even less in vocational assessment.

On the other hand, there is now an alternative to traditional computer logic decision-making. Career Evaluation Systems, Inc., uses a computer logic based on the fuzzy logic approach developed by Dr. Lofti Zadeh at the University of California at Berkeley.

What is Fuzzy Logic?

Basically, fuzzy logic allows computer decision-making that "considers all...factors simultaneously in a consistent way...." (Economist, 1983, p. 89). Many companies are using this approach to deal with large numbers of very complex variables; one company is:

> In September, 1985, Tymshare, a California-based firm began marketing a decision-making software package called Reveal that uses fuzzy logic to sort through large data bases and find, for example, companies with high sales and large profit margins for possible acquisition. Without fuzzy logic it would be necessary to set arbitrary thresholds to define high and large, a firm that just failed the high sales criterion but had handsome profit margins would be passed over. (Ibid. p. 89)

The economic problem dealt with in this example is similar to problems in vocational assessment: some persons are "screened out" of jobs or training programs simply because one test score does not reach a pre-determined cutoff point; this happens even when his/her other test scores, etc. are high enough to qualify for the job or training program.

The major characteristic of fuzzy logic in vocational assessment is that it goes beyond the pass/fail dichotomy. It is realistic to assume that almost every person, at some level of competency, could hold virtually any job that is not totally beyond his/her mental and physical capacities. Recent years have seen the growth of numerous physical devices, electronic aids and environmental controls. Just as the devices make pass/fail thinking obsolete, Career Evaluation's fuzzy logic selects occupations that best fit the person in varying degrees of probability.

The central concept of fuzzy logic is probability; in this imperfect world, there is only probability. The best human decision-making realizes this truth and uses it as part of decision-making. If we admit the imperfections in tests and measurements, then we realize that we can only expect to select occupations on the basis of the most likely probability.

How Is Fuzzy Logic Used?

Career Evaluation Systems is a unique, integrated method of assessment. First of all, it tests for human factors and abilities rather than for aptitudes--aptitudes being combinations of factors. These performance tests from widely-known and accepted suppliers, measure physical and mental/intellectual functioning over the full range of human ability, and the raw score results from these tests are entered into the computer for vocational decision-making.

During the test battery administration, it is possible that a client cannot take one or more tests because of an impairment. In this situation, a test score of "Could Not Take" is entered. The use of the "Could Not Take" category provides the flexibility needed when testing disabled persons, and this flexibility itself becomes a part of the fuzzy logic calculation. The test factor becomes the minimal value in the relevant equation(s), and allows the total combination of values (some of which could be quite high) to realistically evaluate the probability of the client's performance in the category.

All test results are then combined by fuzzy logic methods and converted to measure the client's level of functioning in each of the 24 Data-People-Things worker function categories. As many as 13 test scores are used in any one equation to satisfy the DOL's verbal definition for that category.

Therefore, the core of Career Evaluation Systems' computer methods for vocational conclusions about a client are based in:

(1) The fuzzy logic structure of combining test score factors in their natural mixtures of high/medium/low's so that,
(2) the person's level of vocational ability can be defined in each of the Data-People-Things criteria.

This is the same method that would be used by an evaluator's personal analysis of a client's functioning: "how do the mix of test scores on this client relate to vocational performance?"

Instead of test results one-for-one being forced to meet its matching requirement for a job, test results are being considered simultaneously in a consistent way to reveal the probably level of functioning in each of the 24 vocational requirements.

Once the level of functioning is stated for each of the 24 DPT categories, the computer then selects specific jobs matching the client's highest combinations of Data-People-Things categories first, and continues searching for the next highest until the search is exhausted. Thus, the job search portion of the printout will list jobs for the client in terms of probabilities--the highest probable match of client-to-job first, on down.

The job matching portion of the computer program also includes screening for GED levels and physical/environmental limitations if the evaluator requests, and there are also other major features about the printout, providing counseling guidance, which are not appropriate to today's presentation. A full technical paper is available for further information.

In conclusion, vocational decision-making with Career Evaluation Systems means selecting occupations that the client will most likely do best. The system both assumes and assures that the client's strengths will be balanced against some very low scores. The fuzzy logic approach ensures

a more humanistic and common sense approach to occupational selections than systems built on traditional logic.

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DEVELOPMENT OF A SELF-ADMINISTERED COMPUTERIZED VOCATIONAL ASSESSMENT SYSTEM

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Abstract

With the advent of the microcomputer have come many creative applications of technology. In the area of vocational evaluation, computers have been used for administering tests, for recording, scoring and interpreting data, for producing reports, for retaining test data and for performing statistical analysis of large datasets. KEVAS, an acronym for Key Education Vocational Assessment System, was designed to provide all of these capabilities.

KEVAS technology resulted from the integration of test devices and materials into a computerized test station. The KEVAS unit consists of a microcomputer, coupled with specialized test hardware. Self-administration, scoring and interpretation of raw data, storage of individual demographic data and on-site printout of results from thirteen test areas are provided.

The group database which KEVAS maintains may be utilized for providing descriptive statistics or to identify areas of group need and functional strength. This information may be used in program development or to identify needed support services. Group data analysis has also been demonstrated as an aid in instructional modification, educational/vocational program development and/or evaluation, basic research, and economic development.

The goal of vocational assessment is to identify the performance capabilities of the individual, so as to match these abilities to the requirements of an occupation or training program. When an individual's performance profile is matched effectiveley with the functional requirements of the vocational option using a "goodness of fit" model, an optimal placement results and potential for success, for both the client and the employer or training provider, is enhanced. Utilizing computer technology to accomplish this matching process enables the user to achieve a high degree of consistency and precision.

In his introduction to Witkin's work in perceptual psychology (1954), Gardner Murphy described the research as a search to integrate performance elements, as evidenced by perceptual tasks, with personality attributes. Indeed, Witkin and his colleagues did demonstrate the relationship between specific personality factors and corresponding patterns of performance on perceptual tasks.

A question which may arise, however, is whether personality characteristics and perceptual performance patterns are linked to job functioning. We have postulated that perceptual style and personality attributes are elements which are linked to job performance and we have attempted to construct an assessment system for measuring these factors in a direct and quantifiable manner.

In an earlier work (Penfield, Krass and Conlon, 1984) elements of The Key Education Vocational Assessment System were described and reliabilities for the test components were reported as ranging from a low of .63 to a high of 1.00. Research utilizing the Key System has demonstrated that it effectively predicts job performance potential in an unbiased fashion with regard to age, gender, sex or ethnicity (Penfield, Krass, and Conlon, 1985).

George Miller, (1983) in reviewing Gardner's Theory of Multiple Intelligences lists those mental faculties which identify "different kinds of intelligence". Most major tests measure "verbal intelligence" and what is described as "performance intelligence."

We postulate that basic processes involving measurable attributes underlie both verbal and performance effectiveness.

KEVAS is built around a series of psychophysical measures, which are physical responses (i.e. reaction time, auditory memory, etc.) which reflect more sophisticated psychological aspects of functioning.

For example, when we measure hand strength, we also measure manual persistence, or how long an individual will persist after mastering a trying task. We are interested in measuring basic hearing acuity, but are even more interested in auditory memory, and in determining what perceptual mode is preferred by an individual. We believe that particular occupations may be best performed by individuals with specific perceptual preferences: auditory, visual, combined visual/auditory, tactile, or yet other sense-dominance.

KEVAS evolved empirically. An earlier device, the Key Tabletop Lab, included only a reaction-timer, a hand grip measure, and a component for measuring the visual processing-learning mode.

As we undertook research with groups in varied settings (handicapped high school students, dislocated auto workers, Park Ranger and Correction Officer applicants, mechanics, clerical personnel, electronics technicians, disadvantaged youth, vocational rehabilitation clients, and normal adults and youth seeking vocational direction), we added devices to measure auditory acuity, auditory memory, auditory localization, fine motor adeptness and speed, as well as tests of non-language based abstract reasoning ability and of expressed vocational interests. Tests of arithmetic skills, reading ability, functional literacy, and knowledge in specialized areas were also included.

With the advent of the microcomputer, the development of a self-contained test administrator with report producing capabilities became feasible. The development phase extended over three years and the end product is KEVAS, an acronym for Key Education Vocational Assessment System (Figure 1). It is a transportable test station which integrates all of the test devices developed earlier, and which directs the test-taker through a series of varied performance protocols via specialized software. Based on experience with interactive test devices, a primary objective in the development of KEVAS was the achievement of a consistent administration protocol which would eliminate examiner variation, but at the same time be capable of accomodating to situational variables. KEVAS software allows for administration consistency, while at the same time permits an on-site proctor to respond to subject needs by interrupting, restarting or regenerating a subtest via integrated keyboard access. This keyboard is also used to enter subject demographic and historical information, to review and verify test performance, and to enter data from additional measures for integration into the client database and individual report.

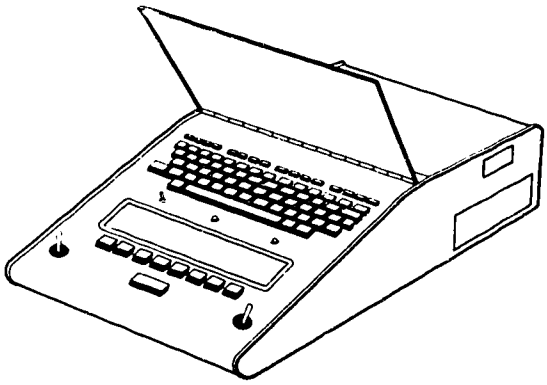

Figure 1. KEVAS (Key Education Vocational Assessment System)

KEVAS hardware was constructed to facilitate subject interaction. A liquid crystal display similar to that found in pocket calculators was selected for use, as it provided a less-threatening visual stimulus than the conventional Cathode Ray Tube, since test anxiety was a factor we wished to minimize. The LCD also offered the practical advantage of displaying larger print.

KEVAS records all subject responses and will printout raw data on request. The device scores individual test performance against a norm, which is preselected by the user, and which is intrinsic to the software. An interpretive graphic profile report is generated on-site.

In writing about computer applications, Matarazzo (1986), states "this new technology offers considerable potential for advancing clinical interpretations of the products of computerized testing". Fowler, (1986) indicates that computer-based test interpretations are accomplished consistently and offer the additional advantage of being able to manage large amounts of data.

In addition to utilizing a consistent interpretive procedure, one of the more unique capabilities which KEVAS

offers is the ability to retain all client data for subsequent analysis. This capacity allows for on-going refinement of norms and a diversity of research applications. The data collected by KEVAS can be uploaded to a larger computer for application of a variety of analytical and data management procedures.

The final phase of KEVAS development is focused toward integrating the vocational matching protocol, which matches the individual performance profile to occupational and/or training requirements. To date, functional criteria have been developed for more than 600 occupations and 75 vocational training programs. The highest expressed interest areas are utilized as the primary sorting variables, and the degree of exactness to be used in the matching process can be adjusted to local needs. This capability allows for a refined fit to be utilized for personnel selection programs, while a more lenient match, may be utilized for placement into training options.

The development of KEVAS reflects the hard years of thinking, effort, and work of numerous professional people, each representing a particular field. Our task is to produce, to the limits of our expertise, a reliable and meaningful assessment which directly relates to the type of work that people do, to their skills, their mode of perception, their persistence, their reasoning and abstracting abilities, and their motor skills. For these are the actions of work.

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VOCATIONAL EVALUATION: WHAT DIRECTION

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ABSTRACT: After providing a rationale for the importance of work in our society, the history of measurement as utilized in vocational evaluation is traced through the early pioneers of psychometric testing and personnel selection. This historical review focuses on the departure of rehabilitation from the traditional guidance movement and emphasizes the roots of that movement and the differences. The current practice of vocational evaluation in various settings is discussed with particular emphasis on legislation, the diversity of settings, and the effect of reduction in funding for social and medical services. Lastly, the paper predicts future directions for the field of vocational evaluation.

The purpose of this paper is to look at the place of vocational evaluation of individuals with disabilities in the overall framework of the history of the testing movement, expound on current pressures on practice and predict some logical future directions for this expanding field. To begin that journey, one must first look at the importance of work in the American society.

Has it not ever seemed odd that we believe so strongly in the concept of everyone working that we insist that the most severe of the mentally ill, retarded, or physically impaired be called up to work duty? While doing this, we have claimed that it is for the good of the disabled to work whether they think so or not. Max Weber in his classic text on The protestant Ethic and the Spirit of Capitalism explained that this American embrace of work is a function of the Protestant Ethic of the founders of this country who felt that work was a demonstration of the calling of God. He stated that "the fulfillment of worldly duties is under all circumstances the only way to live acceptably to God. It is the will of God and hence every legitimate calling has exactly the same worth in the eyes of God (p. 81)." Weber goes on to point out that this "Calling" as demonstrated by enthusiasm to work is one of the key tenants of the protestant Ethic that has so permeated the American culture that it has underpinned the concept of Capitalism and made that concept work in America. What it has meant for us in the public sector is that we are empowered to carry out this cultural imperative with the disabled. We are in essence the arm of Society and the protestant ethic in assisting the disabled in reaching their calling. That is the basis of our job, but how did we adopt the methods that we utilize? To

understand that requires a basic understanding of the history of psychological measurement.

HISTORY

If you accept the notion that one of man's basic drives is to find order out of the chaos in which he finds himself, then the concept of trying to measure things to monitor changes or cause and effect is understandable. Measurement is one cornerstone on which scientific discovery rests. It is the basis of statistical treatment and of much of what we believe as truth. Early measurement of humans was often done with practical tasks by physicians, physiologists, and biologists. For example, 19th century psychiatrists worked to discover practical tasks from the noninstitutional world which would distinguish normal from abnormal subjects. Such things as observed reasoning and persistence of effort were utilized. Chronbach (1984) credits the early work in psychological measurement to a late 19th century interest in the development of the sciences which resulted in Wundt opening his psychological laboratory in 1879. The purpose was to discover quantitative psychological laws comparable to those in physics. He was then not concerned with individual differences but with general human behavior principles.

Wundt's work was in opposition to Alfred Binet, another researcher, whose work in pre 20th century France was to study individual differences. Binet was head of a commission charged with determining a method of truly identifying the retarded in order to make appropriate school placements. In trying to develop a measure to differentiate brighter from duller children, Binet tried all sorts of measures including digit recall, cranium size, mental addition and even palmistry. He became pessimistic regarding the practical possibilities of testing when his attention was shifted away from studying the parts to a look at the whole which resulted in his assembling an assessment procedure guided by accumulated data rather than isolated trait data (Wolf, 1973).

In the same period, Munsterberg's experiment with motormen in utilizing a work sample as a selection test is considered the beginning of research on tests for personnel selection (Ghiselli, 1973) and the first use of a work sample in job selection. Thus, three different approaches to the study of human behavior were prompted by a need to discover universal laws of human behavior, individual differences from testing, and personnel selection techniques from work samples. These situations are still reflected in the current work in psychology.

The testing movement, however, followed the path set by Binet in its attempts to predict from various measures of human traits. This was evidenced at the start of World War I when leading psychologists developed the Army Alpha classification test which measured simple reasoning, ability to follow directions, arithmetic, and information. Later, Spearman, a British psychologist, sought to isolate a general learning element and the field proliferated single ability measures which Nadolsky (1971) has characterized as the MicroAnalysis era of vocational assessment due to the focus on the individual trait. Chronbach (1984) has suggested that by 1940, psychology became convinced that due to the variety of single ability tests, this concept of predicting from single abilities was insufficient in explaining and predicting human behavior. This was later supported by Ghiselli (1966) who comprehensively reviewed studies on single trait tests as predictors and found a coefficient of correlation of .19 with job proficiency criteria. He later updated that review with one on Occupational Aptitude tests as predictors and found a grand mean validity coefficient in all studies of .39 for training criteria and .22 for job proficiency. These were on measures such as intelligence, mechanical comprehen-

sion, spatial ability, motor abilities, perceptual accuracy, and personality (Ghiselli, 1973). That concept of single traits as predictors lost favor in the 1940's, however, the results of that early work is still evident in individual trait tests such as the Purdue Pegboard and tests which cluster the scores of various traits such as the General Aptitude Test Battery.

Before World War II, interest had developed in utilizing other methods of assessment including what Nadolsky (1971) labeled the MacroAnalytic techniques observing persons in their environment, i.e., studying the entire functioning person. In Rehabilitation settings this was a much used technique of the sheltered workshop movement. In these work places, work was thought to be therapeutic and persons were assessed by their goodness of fit to the setting. This concept gained favor in Rehabilitation after World War II when the proliferation of sheltered workshops to serve the disabled and immigrating Europeans needed an assessment focus. It did not gain wider acceptance until later after the rise of behaviorism in the 1960's.

Several occurrences led to the departure of Rehabilitation from the general psychological and personnel selection testing movement. One was a growing dissatisfaction of rehabilitation personnel in using tests with the disabled. They not only did not provide assistance in the guidance process, but they often discriminated against the disabled in the use of speeded tests and inappropriate norms. Another was the passage in 1954 of the Hill-Burton Act which provided bricks and mortar monies for building Rehabilitation facilities. As stated later by the then Director of Alabama Cripple Children and Rehabilitation Services, Freddy Wise, the 50's were a time to build buildings and worry about programming later (Wise, 1972). This surge of building led to a proliferation of Rehabilitation facilities in need of programs. The advent and development of the TOWER work sample system first marketed in 1954 filled a void and became the basis of the standard vocational evaluation process of the time. Rehabilitation facilities used to providing therapy services saw a bonanza of service availability by sending their Occupational Therapist to the six week TOWER training and offering evaluation services. This worked well for a few years until Occupational Therapy moved in the direction of medical services and abandoned vocational evaluation.

The banner of work evaluation with the disabled was next taken up by a ragtag group of recruits with backgrounds ranging from education degrees to high school degrees who were hired on and taught vocational evaluation on the job. This results in an emphasis on doing what your neighboring rehabilitation facility would let you steal until you could become TOWER trained, if trained at all. The result was a combination hodgepodge of evaluation methods from standardized trait tests and copied work samples to homemade tests which mimiced the work done in the sheltered workshop. Through all of this was the belief that if a client was watched participating in simulated or real work, good assessment results would follow. It was in this atmosphere that evaluators eagerly pursued a few new developments such as the Singer System for Occupational Exploration was developed for job corps projects and the JEVS work sample which was finished for the Department of Labor to use with the disadvantaged.

In 1973, the Rehabilitation Act of that year placed emphasis of rehabilitation services directly on the severely disabled which were being served primarily in rehabilitation facilities. This had the effect of reemphasizing vocational evaluation services as the key starting point in serving this population. At the same time several states, most notably Arizona, altered their state worker's compensation laws resulting in the provision of mandatory rehabilitation services to these workers. Companies such as Valpar developed to fill that need and to provide tools to assist in

the process. Likewise, the disabled were not ignored in the educational system with PL 94-142 providing impetus for the testing for retention and placement of disabled children. Similarly, vocational education special needs funds were set aside for culturally disadvantaged and handicapped. Both of these reforms in educational legislation and in worker's compensation legislation have led to the greater utilization of vocational evaluation methods and techniques in school and private practice settings.

While the guidance and screening testing of the disabled was proceeding in one direction, the entire testing movement was coming under legal scrutiny in personnel decision making based on test results. The landmark case of Griggs vs. Duke Power focused attention on the consequences of a selection process if tests have an exclusionary impact. It paved the way for federal courts to look at the Equal Employment Opportunity Commission's Guidelines on Employee Selection Procedures as the standard by which selection procedures should be judged (Sherman & Robinson, 1982). The EEOC was established as the federal advocate for groups that might be discriminated against. Most of its work has been related to testing in personnel selection. Vocational evaluation in rehabilitation has escaped conflict with the EEOC due to the guidance nature of its decisions and its use of content valid procedures. However, in the personnel arena, its decisions have changed the nature of test usage in areas such as state merit systems and private business hiring practices.

In conclusion, testing of the disabled has developed from the roots of modern psychological testing but departed in the use of work samples and real work activities as part of the overall assessment strategy. Even with those departures, the field has retained the use of traditional ability tests even though they have lost favor in the psychological community due to their poor record of prediction ability. The field has been shaped and influenced heavily through legislative initiatives which have provided critical scrutiny of testing as a method of employee selection and through new or revised laws which have defined new settings of practice. In the next section, the result of those directions along with other influences will be discussed as it relates to current practice.

CURRENT PRACTICE

Current practice in vocational evaluation has been affected by additional legislation, diversity of settings for practice, and the reduction of funding in all aspects of the social and medical services. While legislative changes in the 1970's have made vocational evaluation of the disabled attractive to more settings in the past decade, the most recent changes indicate a mandatory assessment process in the vocational placement of special needs students. As Nadolsky (1985) noted in his presentation for the first Issues Forum, a field does not professionalize without a broad base and it appears that vocational evaluation is gaining that base. Evaluation and those performing it have diversified from the days where the only job openings were found in the public rehabilitation sector, and, the field is much the better off for that diversity. This has also presented difficulties.

Problems have arisen in the role strain experienced by those trained for other occupational specialties such as the rehabilitation counselor, special educator, vocational educator, school guidance psychologist, occupational therapist, and veteran's administration counseling psychologist. They have a loosely defined new job description placed on them after years of professional preparation in related areas with different functions. Not only do they have to accept this new label and question its authenticity, but they have an entirely new list of job duties to explore and often learn. Yet those fields are determined to have a piece of the assessment pie and should bring their

unique skills to the problems at hand. The problems of territoriality brought by diversely prepared professionals entering the field of vocational assessment are numerous. First is the struggle for ownership which is often fought along lines of certification and accreditation issues. Thus, school systems are reluctant to accept Certified Vocational Evaluators from the Commission on Certification of Work Adjustment and Vocational Evaluation Specialist and remain in favor of those with teaching certificates. Others such as Hohenshil (1974) and Levenson (1984) see the vocational assessment process fitting within the training of the "vocational school psychologist". In much of the literature oriented to the school population, a common thread exists of the uselessness of the rehabilitation based evaluation for school system needs. This territoriality is also seen in the fight for which professions will qualify to be the vocational specialist in certification requirements of the Commission of Accreditation of Rehabilitation Facilities and the Joint Commission on Accreditation of Hospitals.

A second problem with diversification has to do with the fragmentation of knowledge and numbers when different organizations representing different sectors splinter into unique evaluation oriented organizations. This trend can be seen in the formation of the Vocational Evaluators in the Private Sector organization of Southern California and the recently formed vocational evaluation organization within National Association of Vocational Educators of Special Needs Persons. Other organizations have been altered to reflect a growing interest in vocational evaluation. For example, a sizable portion of the programming of the Division on Career Development is devoted to vocational evaluation as are articles in recent issues of the American Journal of Occupational Therapy. Unfortunately, most vocational evaluators probably do not belong to more than one organization which has resulted in the assessment wheel being reinvented several times. The resulting fragmentation of numbers has presented the most difficulty, however, in that any of the organizations which specialize in vocational evaluation have been limited to few individuals. Therefore, while the diversification of vocational evaluation has an overall positive impact in broadening the base of the profession, it has had the negative impact of increased fragmentation of the field and increased competition for few assessment dollars.

With new markets for evaluators has come new pressures for the assessment process to change. Most notable of these changes has been the push for ever shorter evaluation. At one point, vocational evaluators thought little of having over ten clients per day, all day, for a period of weeks and in some cases, months. This model was shown, however, to be cost effective in the State of the Art study of VEWAA a decade ago (VEWAA, 1975) by having vocational evaluation be a third order or phase of assessment. It appears that model worked so well that it has pushed vocational evaluation to the level of first order assessment in some systems. With evaluators in the private sector charging up to $30.00/hour for their services and school based evaluators facing hundreds of students per year, the pressure has been to reduce the number of client contact hours with assessment often measured in hours rather than weeks. Although this change has often reduced daily loads, it has caused a quantum leap in expectation on prediction from test results.

To accommodate the interest in quicker testing, work sample manufacturers have abandoned work samples and fallen back on GATB imitator trait tests and computerized job search as the method for the 1980's. This has allowed the rapid testing and job title identification methods to be in vogue as a complete vocational assessment, even though a wealth of accumulated research show aptitude tests used alone are poor predictors of job

performance. It is particularly interesting that the field of psychology has abandoned trait tests in favor of behavioral models, yet vocational evaluators have been caught up in a revisit to trait testing models, even in the face of evidence that they do not believe in the results. In a telling article, Murphy and Ursprung (1973) performed an in-depth qualitative research analysis on an urban and rural rehabilitation evaluation program. On one of their more interesting findings, Murphy and Ursprung reported the evaluators studied were surrounded by an aura of technical-clinical sophistication, however, the evaluators felt that their instruments and procedures were not sufficiently discriminating for decision making purposes. They placed their trust instead in an ideological notion that disabled people could only be successful if they were motivated. The concept of motivation was the key determiner of recommendations. The really disquietening part of that was that motivation was characterized by a number of behaviors which represented compliance.

In support of the notion that tests are not necessarily the best methods we use, Anthony and Jansen (1984) in a review of literature on predicting vocational capacity of the chronically mentally ill found six studies which together indicated that intelligence, aptitude, and personality tests are poor predictors of future work performance for this population. This finding is reminiscent of Ghiselli's work. They did find evidence that the best clinical predictors of future work performance were ratings of a person's work adjustment skills from a workshop or sheltered job site setting. This may support Tom Brandon's contention (Brandon, 1984) that time may be the vocational evaluator's best allie. We may be doing the field and our clients a disservice when we overshorten the evaluation process. As an example, in one Virginia setting serving high school special education and special needs students, the evaluators spend two to three weeks in assessment and their recommendations are well received by vocational instructors. Such specifics as use of tools and ruler reading skills were found helpful as instructional level locaters by the teachers. In another setting in Birmingham, the evaluator is charged with giving an aptitude battery and running a job search as their evaluation method for the same population. She spends about four hours with each student, seeing several at one time, feeds her results into the computerized report generator and sends that to the school system. As far as she knows, those reports are filed in the students' central file and not used. She does, however, do a volume business. The point to be made is that on the current scene, more of us are adopting a process which we may not believe in and which objective data indicates does not work. It does not make sense in the future to return to long term assessment but we may be better served to swing that pendulum back toward that direction.

The third most notable pressure affecting current practice has been the reduction of federal funding for social services. This has had the impact in public sector rehabilitation of forcing programs into a cutback or diversification of their referral source stance which has had a positive impact on broadening the base of the field. In education and private practice markets, an immense reduced federal funding does not appear to have had impact. However, it has had a profound effect on the job availability and duties in some specialties such as rehabilitation counseling and occupational therapy. For example, almost twice as many evaluators in Thomas' (1985) study of VEWAA members reported degrees in Rehabilitation Counseling rather than Vocational Evaluation which reflects the depressed job market in rehabilitation counseling compared to the active one in vocational evaluation. With occupational therapy, the results of federal initiatives to reduce hospital costs has left many O.T.'s needing additional

treatment or services for which they can charge. Some see vocational evaluation, a market they left thirty years ago, as a natural one beginning with physical capacity evaluation which insurance companies will pay for to primary vocational assessment and work hardening, i.e., work adjustment. In recent moves, the Joint Commission on Accreditation of Hospitals has declared standards for the mandatory inclusion of vocational rehabilitation services to allow hospitals to become accredited with a rehabilitation emphasis. Occupational Therapy would like to see themselves in that role. Further, the American Occupational Therapy Association has asked the Commission on Accreditation of Rehabilitation Facilities to broaden the requirements of the vocational specialist to include occupational therapy. It might be expected that as the federal funding pie continues to shrink and the third party pay funding possibilities continue to grow, vocational evaluation will continue to be battered by fights for territorial claim. In the long run, these pressures, changes, and diversifications will shape the field and will be viewed by those ramaining as good. They do signify a new era approaching rapidly and point to fundamental restructuring of our ideology and methods pointing to growth in vocational evaluation in becoming a profession in the future.

FUTURE DIRECTIONS:

The future of vocational evaluation can be predicted from directions currently being set within the profession as well as by viewing ways within the American culture to which the field should respond. It can be expected that changes will occur due to the impact of technology in the field, the increased professionalism of vocational evaluation, a further diversity of evaluator settings, and the development of new models of vocational evaluation.

While numerous articles in the past have discussed the role and impact of technology in the American culture and specifically on the field of vocational evaluation, it is likely that today's vocational evaluators have hardly begun to feel that impact. However, this field has long thrived on technological advancement and acceptance of improved technology. For example, it was not surprising that McCray and Blake Moore (1984) in their national survey of rehabilitation facilities found that the service area most likely to use computers was vocational evaluation. As programs which assist the evaluator become available, this field should continue to lead the way in acceptance and use of those programs producing what may be called the technical evaluator. An interesting phenomenon has occurred in that the vocational evaluator of the 1980's has had at her disposal an increasing amount of access to data to the point that McClanahan (1985) has estimated that a vocational evaluator can look at over 12 million bits of occupational data before making recommendations. It is likely that this trend will continue to develop with the technical evaluator having the opportunity to oversee an increasing amount of job related and person related data which will need to be synthesized and should form the basis of ever increasingly accurate predictions. This movement will be fueled by the lack of adequate universities to educate enough vocational evaluators to fulfill the expanding need over the next 20 years. Therefore, the technical evaluator of the near future will have a role more in overseeing and developing processes and will spend less time in direct client contact. In other words, the future evaluator will have less client contact and more machine contact. The personnel slack, however, will be taken up by machine generated processes and by increased use of bachelor trained floor personnel. It can be expected that most of the tasks that evaluators find tedious, time consuming, or too immense to tackle will be done in the very near future by a computer. As can be seen today, computer formated tests are being offered as replacement for most paper and pencil test. As is

noted in the Apticom, not only can computers be used to be the means of testing, but they can also be used to score tests, to report results and to make recommendations. It is not too difficult to test for aptitudes; however, it is still difficult to observe behavior without people involvement. Computers, however, can be used to assist in directing that process and in keeping track of results and synthesizing those results. The bain of evaluators, report writing, should be entirely taken over by the use of computer programs to generate reports within 5 years. Program evaluation software is currently available and is expected to be in widespread use within the near future as will be programs which sample ability on tests and predict maximum performance, store client records, provide occupational exploration experiences, direct evaluation plans, write work adjustment program plans, provide computer assisted instruction in work readiness, and monitor behavior observations. These are just the beginning programs that should be out before the end of the decade for which there is a need. Beyond that it can be expected that the whole evaluation/decision making process would be examined closely and will be supplanted in many instances by computer expert systems which should do a better job of making vocational predictions based on complex formulas with statistical validity.

With further expansion and development of the knowledge-base of vocational evaluation will come increasing professionalism of the field. Long noted as a field partially controlled by the rather inadequate tools and techniques available to it, the future in vocational evaluation belongs to the informed evaluator who can design a process which can be proven to meet the need. It is expected that more universities will want to be involved in the training in this specialty, and that the training will be done in a variety of home based knowledge areas from psychology to medical related programs. The benefit of having the best trained evaluators will be primarily in the research available to field personnel and improved job tenure trends in stabilizing the field. Thus, Sankowski (1969) saw that vocational evaluators tended not to stay in their jobs past two years while more recently, Thomas (1985) found that evaluators were more likely to have been in their careers for an average of six years. This trend will continue to develop as the status benefits in a true career ladder develop over the next decade. Another important inroad to the developing professsionalism would be contributions made by those coming out of such fields as psychology, personnel management, education, and engineering and bringing with them knowledge bases and a uniqueness of perspective which should provide a pluralistic enrichment of the field as a whole.

This diversity of backgrounds should also in the future be reflected in a widening group of vocational settings in which to practice. Those settings can be predicted today by looking at all settings in which work is likely to be important. For example, it can be expected that once entering the school system markets with special populations, there will be a move to offer vocational evaluation services to regular education students as a part of the guidance and counseling services in school systems. The private practice setting has been one of rapid growth for vocational evaluators and should continue to expand as vocational evaluators move more into the mainstream of employment related litigation with the disabled, divorced, and others needing a reading on their vocational future. It can be expected that a tremendous growth area for vocational evaluation will be in medical settings as the availability of third party insurance pay develops in hospitals. Therefore, when Blue Cross-Blue Shield begins paying for vocational evaluation services in a typical hospital setting, a clamour will be on in various fields to provide that service. While some ser-

vices may be open for the general population on a private fee basis, the largest potential area of new business appears to be in personnel selection. Thus, the technology and tools of the evaluator should be incorporated into both initial selection procedures and in promotion procedures in many mainstream industries due to the tools and techniques of the field meeting federal guidelines for content related testing. In this same light, there may be an increased interest in the relatively successful workfare programs for the welfare recipient which based part of their success on the use of vocational evaluation to place people in adequate training and employment programs. Again, where there is a need for vocational screening, vocational evaluators will port their service. Of all the areas which offer potential expansion, none looms so large in the future of vocational evaluators as that of a vocational evaluation with the increasing geriatric population. Thus, as we develop more time to spend in other than monetary gain activities and, as our population incorporates more retired persons, it can be expected that the tools and techniques of our service can be equally well applied in developing plans for recreational and nonpay activities for those populations.

As mentioned earlier, we have in current practice backed up to the use of shorter and shorter evaluations with more reliance on aptitude testing. It is likely in the future that we will see reactions to that so that more time is spent exploring work personality and better testing methods will be developed which will rely on improved computer generated tests and in the knowledge gained from the behaviorism movement. It can be expected that locater tests on a computer will be used in which initial questions will locate the person on a scale of ability which will then cause the computer to open up a number of additional questions which offer finer and finer discriminations of abilities so that individuals of a wide range of capability will be better measured with this testing procedure. The knowledge from behaviorism will give us methods of changing people which should greatly influence the behavioristic diagnostic services which will be incorporated into the future of the vocational evaluator's tool box. It can also be expected that there will be more of an emphasis toward fitting that person to the environment rather than the current emphasis of changing the entire world to meet the needs of disabled people. For example, we will be using the current work undergoing resulting in the improved understanding of brain functioning to provide chemical and other measures of boosting the IQs of retarded and improving learning capabilities of those with specific learning disorders. It could be expected that we will use increased technology as aides to disabled people to provide them with improved mobility and sensory functioning. Therefore, part of the job of the vocational evaluator may be to match a person and his disabilities in the rehabilitation sector to the appropriate technology to basically negate those disabilities and then to do job screening and predictions.

It is extremely encouraging to be in a field which has for 40 years been slowly developing and of little interest to the general public and to see it come alive and take off in so many directions as to find a number of professionals laying claim to the knowledge and rights to practice its expertise. That trend has started since the early 1970's and should gain increased strength and momentum through the end of the 20th century. While in a number of professions the concept of today's professionals becoming tomorrow's technicians might hold true, this field should find that it incorporates technology into the number of settings and different models but evolves into a professional discipline with the necessary career ladder benefits and renumeration to make it an exciting place to be.

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